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THE PRESIDENT'S PAGE

Everyone leading an active life today realizes that extensive and rapid changes are taking place, not only in our physical surroundings, but also in our methods and techniques of doing almost everything. Even our birding is experiencing changes. In years gone by a large part of the significant contributions to ornithology came through observations and researches of individuals working essentially by themselves in the field as well as in the laboratory. Although there are still unlimited opportunities for individual work, today many resourceful bird students are turning to cooperative projects to furnish the answers to many baffling questions that still face the ornithologists. Those bird researchers with organizing tendencies and facilities might well probe deeper into the possibilities of such organized endeavor as a means of securing data bearing on problems of migration, local movements, homing and related bird phenomena.

Cooperation between bird students as it pertains to subject matter alone is not new, of course. The enormous bird banding program, direction of which was assumed by the United States Biological Survey back in 1920, attests to that. Observation coordinated as to time, as well as to subject matter, is the more modern approach, although even this technique appeared early in the National Audubon Society's Christmas censuses. The coordinated reporting of a single season's findings on certain species, such as has been carried on by the Wisconsin Society for Ornithology, has been productive of much better over-all pictures on the nesting distribution and migration of these species than could be secured by random reporting. The U. S. Fish and Wildlife Service's nation-wide study of the migration of the Broad-winged Hawk, carried on under the direction of C. S. Robbins, Patuxent Research Refuge, Laurel, Maryland, is bringing to light many new facts concerning the routes, rate of migration, and the effects of weather on the flights. And very much in the public eye just at present is the project of coordinating nocturnal observations of bird migrants seen crossing the face of the moon. Inaugurated by Dr. George H. Lowery, Jr., Museum of Zoology, Louisiana State University, Baton Rouge, this new and somewhat romantic form of bird study has attracted many cooperators and is producing factual data on many phases of the still rather mysterious nocturnal movements of birds. Both of the last mentioned projects are operating at the present time, and the leaders of both would welcome the services of more volunteer observers.

The above are examples of projects organized on a continent-wide basis. Smaller local field studies carried out cooperatively by the members of local clubs can also be productive of new and more accurate information. I recently enlisted such cooperation in determining the extent of daily movements of wintering American Golden-eye flocks, while the Craighead brothers used such methods in outlining the daily feeding movements of hawks in Jackson Hole, Wyoming. With the increase in numbers of local bird clubs more and more problems, difficult or impossible of solution through individual observations, can now be attacked by such coordinated teams. And most active clubs have keen and experienced members who, having passed through the early stages of field identification, are groping about for projects into which they can direct their energies which will result in real contributions to the science of ornithology. The major lack at the moment, I feel, is of more originality and ingenuity on the part of the leaders of organized groups in outlining such cooperative projects aimed at the solution of the many ornithological problems in need of more and better factual data.

W. J. Breckenridge

OLIVACEOUS CORMORANT

(Phalacrocorax olivaceus mexicanus)

Immature. From a drawing in watercolor made in Mexico by George Miksch Sutton. Fourth in the Hilton memorial series of color plates.

OLIVACEOUS CORMORANT

BY EUGENE EISENMANN

THE Olivaceous Cormorant (*Phalacrocorax olivaceus*) has one of the most remarkable distributions of neotropical birds. It not only ranges throughout tropical America but breeds north to southern Texas, Louisiana, and the Bahamas and south to the sub-Antarctic coast of Cape Horn. It nests in great colonies on coastal islands drenched by salt spray, but is equally common on large rivers and fresh-water lakes. Isolated pairs or small groups can be found on lesser wooded streams and ponds. Abundant at sea-level in the warm waters of the torrid zone, it yet manages to survive on cold lakes high in the Andes. Goodall, Johnson, and Philippi (1951. "Las Aves de Chile," 2:82) report their amazement at finding ten of these cormorants on Lake Cotacotani, east of Arica, Chile, at an elevation of 4,800 meters—almost 14,500 feet.

In appearance and behavior this cormorant much resembles the familiar North American *Phalacrocorax auritus* and *P. carbo*. Distinctly smaller than either, adults of *P. olivaceus* look solidly black in the field, and immatures dull brownish, paling to whitish on the breast in juveniles. In breeding dress, at close range, one can see fine, white, filament-like feathers on the sides of the head and neck, a white line bordering the gular pouch, and the olive-slate centers of the feathers on the upper back and wing-coverts.

My own experience with this species has been chiefly in Panamá. There the nominate race is common wherever sufficient water exists, inland as well as along both coasts. I have seen pairs along small, shallow rivers and lakes, usually perched on trees, not only in the lowlands, but also at altitudes of over 4,000 feet. On Gatun Lake, a large artificial lake created in the building of the Canal, this cormorant is the only swimming bird regularly observed. Here one finds the cormorants drying their feathers while perched on projecting branches of the drowned forest or slipping through the water, largely submerged, with only serpentine head and neck showing. Lines of cormorants can often be noted flying high across the continent from ocean to ocean. At low tide, great flocks, moving in unison, fish where the waves break across the exposed rocks and flats at Panama city. Individuals perch on the spars of fishing vessels or on the sea-wall, unconcerned by the presence of human beings. In the Gulf of Panama these birds are especially abundant, breeding on many islets. By preference nests are built in trees, but on islands where trees are absent low bushes are accepted, and, if need be, the

bare rock or ground. (See R. C. Murphy, 1936. "Oceanic Birds of South America," 2:909–915.)

Several subspecies have been recognized, but the differences are slight, chiefly size and relative proportions. Oddly enough, the nominate race, which extends widely over the tropics, averages larger than the races described from the presumably cooler extremities of the range, both north (*mexicanus* and *chancho*) and south (*hornensis*). The species name *P. olivaceus* used in the A.O.U. Check-List, should be replaced, according to Hellmayr and Conover (1948. *Field Mus. Nat. Hist., Zool. Series,* 13, Pt. 1, No. 2:141), by *P. brasilianus.*

The A.O.U. Check-List Committee, translating the current technical designation, has adopted Olivaceous Cormorant as the English name for the species as a whole. While superior to the unduly restrictive geographic names, such as Mexican and Brazilian Cormorant, that have been used, this selection is hardly felicitous for a bird that is essentially all black. My personal preference would be Neotropic Cormorant, as the species extends over the entire Neotropical Region and is the only cormorant that does so.

11 Broadway, New York 4, New York, September 19, 1952

FALL MIGRATION OF BIRDS AT CHICAGO

BY HOLLY REED BENNETT

Introduction

This study of fall migration is the result of a daily census of land birds in Lincoln Park, Chicago, in the five years 1946 to 1950 inclusive. The conclusions reached are based mainly on the census record of birds that migrate chiefly at night. This paper is a regional study of grounded migrants, most of which arrived during hours of darkness. My conclusions may or may not apply to day migrants and to migrating birds in other regions.

Lincoln Park lies in a 4½ mile strip along the shore of Lake Michigan, the strip averaging about ½ mile wide. The southern boundary is along North Avenue, 2 miles north of the business center of Chicago. The study area was confined to the southern part of the park, south of Diversey Parkway. The 1¾ mile route traversed each morning meandered so as to include the localities most frequented by the various types of land birds. The route varied somewhat, depending on the season and weather. The census was taken each day between 6:30 and 8:45 a.m. during the principal migration period. The daily time spent afield decreased as migration waned into November, when days are short and birds few in number. On Sunday more time was available and the route was traversed at a more leisurely pace. The observations cover the periods August 1 to November 30 in each of the five years.

Some of the variations in this census record are due to purely chance differences in the number of birds present in the study area from day to day, and from season to season, and to the chance differences in the number of birds present which are seen by the observer. This fortuitous factor is most important in day-to-day counts, and in the yearly records of species seen in small numbers; its effect is reduced in the larger counts of the more abundant species. In this study the major differences in the daily and yearly counts of the more abundant species are regarded as mostly not fortuitous. Slow changes in bird population are known to take place and sudden changes in the populations of certain species have occurred due to special causes, but I have arbitrarily assumed that the autumn populations of the species involved were approximately the same in each of the five years.

Migration routes are believed to be relatively constant year after year. Birds nesting in a given area normally migrate southward within a certain zone or band of territory, and radical departures from such normal migration routes must be uncommon for most species. The bird waves that characterize the autumn migration, the wide variation in the season counts

of the abundant species, and other features of the census record are believed to be due chiefly to variable weather conditions, and particularly to the invasion of the north-central states by great masses of relatively cold northern air, preceded by cold fronts. This conclusion is reached from a study of the Daily Weather Map for each day, in connection with the Lincoln Park census records, and additional weather data published in the Monthly Weather Review. Also essential was the record kept by the writer of the time of important weather changes at Chicago.

Brief References to other Migration Studies

The importance of the relation of bird migration to wind direction and the cyclonic circulation has only been recognized in recent years. McMillan (1938:402–403) stated "the general hypothesis that, whenever possible, migrating birds ride the wind" and Landsberg (1948) used the expression "pressure-pattern flying" for the tendency of birds to take advantage of tail winds in long distance flights, just as aircraft do. This has been confirmed recently by the notable study of nocturnal migration by Lowery (1951) based on telescopic night observations at 34 stations over a wide area east of the Great Plains and south to Yucatán. He finds that a striking correlation exists between air currents and the direction of night flights, and that the flow of migration is, in general, coincident with the flow of air. Lowery's study was restricted to the spring migration, but this correlation probably applies equally in the autumn. Also important is his discovery that most night migrants utilize less than half of the night for their migratory flights, the bulk of night migration ordinarily being between 9 p.m. and 2 a.m. This is an important limiting factor on the distances ordinarily covered during night flights.

The relation of spring migration to weather phenomena has been discussed and the literature reviewed by Bagg, *et al.* (1950), who conclude that during the period of spring migration, pronounced movement will take place into or through a given region during the interval between the passage of a warm front and the subsequent arrival of a cold front. The winds are southerly in these meteorological areas, sometimes strong. These authors distinguish onrushing waves impelled forward by favorable conditions and arrested waves, which are onrushing waves grounded by adverse weather conditions as the cold front approaches, or by quasi-stationary fronts encountered.

Detailed studies have been made of the fall migration of hawks. Allen and Peterson (1936) found at Cape May, New Jersey, that a NW wind of fairly strong or strong force is almost certain to be accompanied by a large influx of migrant hawks and many smaller land birds. Stone (1937:41, 52–53, 262–263) says of the same region that the great flights are always coincident with a NW wind and a falling temperature, and after shifts to a NW wind the whole Cape May Point area will be deluged with birds, these remarks applying not only to hawks, but to kingbirds, flickers, Woodcock (*Philohela minor*), warblers, and others.

The autumn hawk migrations of 1934-1938 at Hawk Mountain, Pa., were studied by Broun (1939). He noted that the most remarkable flight was during 3 days of NW wind following the passage of a hurricane up the Atlantic coast in September, 1938. His daily records for September and October show that 61.9% of the hawks counted were seen on days of NW to NE wind. The NW-NE wind days show an average count

of 340, which was 2.5 times the 134 average count for days of other wind directions. The later, November records are irregular, with 17.9% of the hawk count on days of NW-NE wind.

Fishers Island, at the east entrance to Long Island Sound, is one of three stepping stones in the migration route of hawks (mostly Sharp-shinned Hawks, *Accipiter striatus*) flying from eastern New England southwest to Long Island. The Fergusons (1922) counted 42 flights during 5 fall seasons, of which 30 were with NW wind and 5 with winds NW to NE. In some cases the hawks flew high with NW wind when the surface wind was NE.

Reports on fall migration published in *Audubon Field Notes* contain comments on the relation of weather to migration. Concerning the 1951 period in the New England region, Griscom (1952:5) said, "There were no less than 17 marked cool waves with northwest winds from July 31 to Oct. 21; as a result the whole eastern coast was flooded with land-bird migrants in wave after wave, producing a huge list of species, and many remarkably high daily counts of individuals." In contrast, Griscom (1948:4) said the 1947 fall migration "was as dull and uninteresting as any in the memory of the present generation," due to the abnormally hot weather from August to October, and the scarcity of storms and cool waves, which resulted in a lack of bird waves, the migrants dribbling through day by day. In reporting on the New York region for the same year, Nichols (1948:5) also correlated the warm autumn weather with the late arrival and uniform flow of migrants, until October cool fronts from the northwest brought migration waves. The similarity of the 1947 migration at Chicago will be discussed later.

Williams (1948, 1949, 1950) has made the most important correlations between fall bird migration and cold fronts in his reports on the south Texas region. He associates the principal migration periods or waves appearing in the Texas coast region with the arrival of "northers" and other cold fronts, with NW to NE winds prevailing at the time of influx. For 1947 he listed 20 cold fronts in July to December and recorded their effects on migration; for 1948 he listed 13 cold front periods, stating that "except for a few straggling individuals, the migration occurs in a series of pushes that involve many individuals and species . . . . The optimum condition of migration is an advancing cold front with falling (not necessarily low) temperature and precipitation in the area north of Texas." Williams listed 17 fall migration periods or waves for the Houston area in 1949, each during a period of northerly winds following the advance of a cold front. He correlates these migrations with temperature drops at Pierre, South Dakota (1050 airline miles from Houston), and Minneapolis, each of which followed the passage of a NW cold front through the upper Mississippi Valley. The writer's Lincoln Park August to November records show migration waves during the periods of northerly winds following the arrival of these same cold fronts at Chicago. There is no evidence that temperature drops were the principal motivating factor that caused these migratory movements. During the spring migration important bird waves are always associated with southerly winds, generally at least moderately strong; they are not induced by rising or high temperatures alone when not accompanied by southerly winds. In the absence of contrary evidence, it seems likely that the fall migrants likewise merely take advantage of favorable winds, whenever possible, to make their long migratory flights. These northerly winds follow the passage of cold fronts and in the northern states and Canada are almost invariably accompanied by temperature drops. But the

writer believes that the favorable wind is the critical factor, particularly in the case of migration waves of small land birds migrating at night in August and September when the temperature effect of a cold front passage is usually quite moderate. The temperature factor may dominate in October and November, when sharp drops to sub-freezing frequently occur.

General Relation of Weather and Migration in Chicago Region

The weather of the Mississippi Valley region is dominated during most of the year by the movement of great masses of relatively cool or cold air coming usually from the north or northwest and masses of warmer air, often of tropical origin, coming from the south. The boundaries between these air masses are called fronts. A cold front is the boundary of relatively cold air advancing into an area occupied by warmer air; it is the advancing edge of the cold air mass. Its arrival at a given point is usually followed by a change of wind from a southerly to a northerly direction. These cold air masses are areas of high barometric pressure, called anticyclones, or merely Highs. (The period of northerly wind following the passage of a cold front will be referred to hereafter as a "cold front period.")

The southward migration of birds in autumn is favored during the period soon after the passage of a cold front through the Chicago area, when the winds are generally NW to N. Most autumn migration waves are of the onrushing type. When storm centers pass south of Chicago, conditions adverse to migration may continue for some time after the wind shifts from NE to N and NW, and in such cases the migratory movement is delayed until the storm passes on and better flying conditions prevail. Such delayed waves are frequent in autumn, but arrested waves are uncommon.

Many weather cycles are complicated and prolonged. Highs moving across the continent may be marked at a given station by more than one cold front. These air masses are really great currents that may flow southward and eastward for several or many days, with minor interruptions and phases, each of which may be marked by a new cold front. A discussion of these complications will be avoided. A person without weather maps merely observes the changes in wind direction and other weather phenomena. The changes from southerly to northerly wind directions generally follow the arrival of the important cold fronts. But if a storm center is passing to the south, as the cold front approaches the wind will shift to E and NE, and then N and NW as the Low center moves eastward.

As a general rule the big migration waves of a given species occur during cold front periods in the early or middle part of that species' migration period. Later the number of birds remaining in the north is so reduced that only relatively small migratory waves can originate there. This obvious fact is of major importance in explaining why the total number of birds of a

given species seen varies so greatly from year to year, a subject discussed later. Following the arrival of a cold front and northerly winds bringing a wave of birds of a given species, the number seen in the study area ordinarily decreases for several days, down to a number more usual for the species at that time of year. The balance between arrivals and departures determines whether the observer finds an increase in his study area on the morning after a cold front passage. Toward the end of a species' migration period the departures commonly exceed arrivals.

The period of strong cyclonic circulation generally begins at some time in September and ends in May. During these months the weather is dominated by the procession of Lows and Highs, storms and cold fronts, that move across the continent in a general easterly direction. During the summer the weather conditions are much more static, the air circulation is more sluggish, and the storms and cold fronts mild compared to the vigorous phenomena of later months. The autumn migration begins during this static summer period and much of the warbler migration has passed before the strong circulation of autumn is established. So the early part of fall migration is in a separate period, not so much dominated by cold fronts.

The principal autumn migration waves into the Chicago region occur during September and the first 20 days of October. The later waves involve fewer birds because by late October almost all of the migratory birds (at least of the species here studied) have already left the regions north of Chicago. The important waves are clearly related to favoring winds, but the sharp drop in temperature that usually follows a cold front passage may be a factor in causing birds to start off on a migratory flight. The cold fronts followed by important bird waves in the period September 1 to October 20 seldom bring temperatures low enough to force the birds to leave the regions north of Chicago. Only a few stragglers remain in the north to be driven south by the late cold fronts which bring the first wintery weather.

The 1949 record will be cited. No freezing temperatures were recorded prior to September 28 at Green Bay, Sault Ste. Marie, Duluth, International Falls, or Winnipeg, and yet at that date the warbler count (exclusive of Palm, *Dendroica palmarum*, and Myrtle Warblers, *D. coronata*) in Lincoln Park had reached 3,525, and later only 258 additional birds were counted. It is obvious that, in 1949, these warblers were not really forced to leave the regions north of Chicago because of cold weather. And in the same year no temperatures under 24 degrees Fahrenheit were recorded at any of these northern stations until October 23, yet at that date most of the later migrants had already passed Chicago, where no freezing temperatures had yet been recorded.

Cold fronts entering the Chicago region may be divided, as regards bird migration, into three groups: (1) cold fronts followed by NW winds, (2) cold fronts followed by NW-NE winds, and (3) cold fronts followed by NE winds. The cold fronts of these types, including some very mild ones, that reached the Chicago region during the period August 10 to November 10 in each of the five years were as follows:

	1946	1947	1948	1949	1950	Totals
NW type	7	6	4	13	8	38
NW-NE type	5	9	3	2	9	28
NE type	2	2	5	4	3	16
Totals	14	17	12	19	20	82

Cold Fronts Favoring Migration into Chicago Region

Cold fronts with NW winds are the most important type as regards bird migration in the Chicago region. The barometric High (anticyclone) and the great air mass which it represents usually moves from western Canada across the northern Great Plains and on to the southeast, passing west and south of Chicago. The arrival of the cold front at Chicago is ordinarily marked by a change from southerly to NW wind. The moderate to strong NW wind generally continues for at least 24 hours, and in many cases for several days. As the High center moves on to the southeast, the wind shifts back to a southerly direction, usually SW.

Cold fronts with NW-NE winds are only a variation of the preceding type, and are always the result of High centers passing north of Chicago. The High center generally moves from the west along the southern boundary of Canada, or from northwest Canada to the upper Great Lakes region and eastward. The southerly wind shifts to NW or N when the cold front reaches Chicago; then generally within 6 to 12 hours the wind shifts on to NE as the High center moves eastward. The NE wind may continue for several days. In many cases storm centers pass south of Chicago as the cold front approaches, which causes the wind to shift through the E and NE to N or NW as the storm passes. The principal flight of birds appears to accompany the initial phase of NW or N wind.

The effect of a large number of these cold fronts and the periods of NW-N winds that followed on the migration of nine of the abundant species is shown in Table 1, which shows for each species the average count on the two mornings preceding arrival of the cold front at Chicago, and on the three mornings following. The average effect is striking, but for individual cold front periods the increase for some of the species is much greater than these averages.

Cold Fronts with Northeast Winds

Cold fronts followed by NE winds are generally not accompanied by bird waves in the Chicago region. They result from air masses moving from northern Canada to the Lake Superior region or farther east. The path of the air mass movement generally lies farther east than the air masses causing cold fronts with NW-NE winds. The High center passes north and east of Chicago. These cold fronts cause the wind at Chicago to shift from a southerly direction to NE, and the NE wind may continue for several days. Such cold fronts generally extend in a west to east direction, moving directly south or even southwest as they approach Chicago. In the types described in the preceding section, the cold fronts generally extend southwest to northeast and approach Chicago from the northwest.

In the Chicago region cold fronts with NE winds are characteristic of the summer period of static weather. They are common during August and early September, and much less frequent later, after the strong cyclonic circulation becomes established. Cold fronts of this type are followed by decreased bird counts in Lincoln Park; during the 5-year period no marked bird waves followed any of these cold fronts. Table 2 gives the warbler counts on the two mornings before and two mornings after arrival of 7 NE cold fronts in August and September. Table 3 gives data for 3 October cold front periods of this type, including both combined warbler counts and the combined counts of Fox Sparrow (*Passerella iliaca*), White-throated Sparrow (*Zonotrichia albicollis*), Slate-covered Junco (*Junco hyemalis*), Tree Sparrow (*Spizella arborea*), Hermit Thrush (*Hylocichla guttata*), Brown Creeper (*Certhia familiaris*), and Golden-crowned Kinglet (*Regulus satrapa*) ("Sparrows etc." in tabulation).

Barrier Effect of Lake Michigan

Autumn migration waves at Chicago are commonly associated with cold fronts invading the central states, accompanied by strong NW to N winds. No pronounced waves occurred during intervening and static weather periods, and this five-year study has produced no evidence that birds migrate across Lake Michigan in any appreciable numbers. Cold fronts accompanied only by strong NE winds never brought migration waves to Lincoln Park. Strong NE winds at all times during both fall and spring, particularly if cold, tend to drive the birds out of the park. During periods of lighter NE wind the moderate increase in bird counts is interpreted as merely the result of southward flights in the region just west of Lake Michigan. With strong NE winds in the Lake Michigan region, birds migrating from areas north of Chicago would naturally tend to fly southwest with the wind, and thus pass west of Chicago.

Table 1

Average Morning Counts in Relation to Passage of Cold Fronts

	No. of Fronts	Before Arrival		After Cold Front Passage		
		2nd Morn.	1st Morn.	1st Morn.	2nd Morn.	3rd Morn.
Palm Warbler	22	7.0	7.4	42.2	24.5	16.4
Myrtle Warbler	25	17.2	14.1	35.3	27.9	21.6
White-throated Sparrow	28	23.6	24.1	75.1	58.9	35.0
Fox Sparrow	22	3.6	3.9	15.6	13.3	8.4
Slate-colored Junco	30	36.0	33.0	102.1	78.5	50.5
Tree Sparrow	20	8.2	4.7	27.2	18.0	11.1
Hermit Thrush	21	5.2	4.8	16.6	14.7	8.8
Brown Creeper	26	2.1	1.9	6.2	4.9	2.9
Golden-crowned Kinglet	23	6.6	7.3	36.9	32.6	22.2

Table 2

Morning Counts of Warblers during September Cold Front Periods of Northeast Wind Type

Date of Cold Front	Sept. 11 1946	Sept. 24 1947	Aug. 30 1948	Sept. 2 1948	Sept. 13 1948	Sept. 20 1948	Sept. 16 1950
Before arrival							
2nd Morning	98	125	—	100	217	437	78
1st Morning	60	123	128	243	236	217	63
After arrival							
1st Morning	57	38	136	151	175	151	43
2nd Morning	79	53	102	60	122	138	72

Table 3

Morning Counts of Warblers and Other Birds during October Cold Front Periods of Northeast Wind Type

Date of Cold Front	Oct. 15, 1949		Oct. 14, 1950		Oct. 21, 1950	
	Warblers	Sparrows etc.	Warblers	Sparrows etc.	Warblers	Sparrows etc.
Before arrival						
2nd Morning	122	135	76	310	32	243
1st Morning	76	130	50	128	19	62
After arrival						
1st Morning	61	92	39	95	14	73
2nd Morning	37	35	23	50	12	33

The converse must also be true. Migration waves moving southeast with strong NW winds must be largely stopped when the west shore of Lake Michigan is reached. Cold fronts followed by strong NW winds result, I think, in concentrations of birds in the area just west of Lake Michigan. Many of the birds arriving in the Chicago area during a cold front period are slow to leave, and the same is true of birds along the west shore farther north. The gradual southward migration of birds from the shore zone north of Chicago results in an abnormal number of new daily arrivals in the Chicago area. The result is that for many days following such a migration wave the count of the species involved will be abnormally large at Chicago, if the weather is mild and the birds do not suddenly leave during later cold front periods.

Early autumn flights of swallows, Nighthawks (*Chordeiles minor*), and hawks are observed frequently along the west shore of Lake Michigan in the Chicago area. Beebe (1933) described the migration of hawks from Ontario southwest through Upper Michigan to the north shore of Lake Michigan, and thence west and south along the lake. Jung (1935:75) says that farther south in Door County, Wisconsin, these hawk flights are confined chiefly to a narrow shore belt only ¼ to ½ mile wide. No general correlation between these day migrations and wind direction and other weather conditions was made.

An August flight of more than 10,000 Purple Martins (*Progne subis*) was observed by Smith (1908) west of Holland, Michigan. The birds flew with a moderately strong NE wind and were restricted to a strip about one quarter mile wide along the east shore of Lake Michigan. The wind continued NE and next morning abundant arrivals of warblers and flycatchers were noted, the first migration wave of the season. In August, 1904, a flight of more than 1,000 hawks was observed at the same locality, also during a period of moderately strong NE wind. This record of a pronounced migration wave on the second morning of a NE wind period contrasts sharply with the relation between migration waves and wind direction observed on the west side of the lake.

Concentrations of migrants are produced along the Atlantic coast during periods of strong NW winds, particularly at Cape May, New Jersey, where the work of Allen and Peterson (1936) and Stone (1937), already referred to, has shown that strong NW winds blowing across the usual line of southward inland migration produce great concentrations of migrants. Even the hawks do not attempt to fly on south across Delaware Bay during these periods. These writers also say that night migrants that flew beyond the coast line are sometimes seen in early morning flying in from the open ocean

against the wind, and Stone records Woodcock and warblers flying in low from the sea at night.

Lakes Ontario and Erie are at least partial barriers to the southward autumn flight of day migrants. Baillie (1950, 1952:14–15) refers to the traditional SW direction of flight of hawks, Flickers (*Colaptes auratus*), and Blue Jays (*Cyanocitta cristata*), along the north shore of Lake Ontario in the Toronto area. He records large westerly flights of the birds farther west in the vicinity of Port Stanley, London, and Chatham, Ontario. But to what extent these lakes hinder the southward movement of night migrants is unknown.

At this point other important questions relating to migration through the Chicago region will be mentioned. What route is ordinarily followed by birds nesting north of Lake Superior? Do they cross Lake Superior, or do they migrate east or west around it? And to what extent do birds other than hawks migrate from Ontario westward through the Sault Ste. Marie area to Upper Michigan, and then south through eastern Wisconsin? The answers to these questions probably account for some of the irregularities in the numbers of northern nesting birds seen in Lincoln Park. This is particularly true of the Golden-crowned Kinglet and a number of the warbler species that nest principally east of Manitoba.

The westward route through the Sault Ste. Marie area may be important in the southward migration of many species during periods of easterly winds in the upper Great Lakes region. Strong NW cold fronts would favor migration south across the Straits of Mackinac to Lower Michigan, or eastward along the north side of Lake Huron and Georgian Bay. The westward route could be followed easily during the late summer period of relatively static weather, before the strong cyclonic circulation of autumn is established. In 1947, no strong NW cold fronts invaded the Great Lakes region until mid-September. In 1950, there was none from September 3 to October 2, and in 1948, none from September 8 to October 1. The first strong NW cold front of 1949 reached Chicago on September 18. Easterly winds during these and many other shorter periods were probably favorable to migration along the westward route from Ontario through the Sault Ste. Marie area to Upper Michigan.

Migration Waves at Irregular Times

During this study there were few migratory waves that arrived at irregular times in relation to cold fronts, in spite of the complex relation in many periods between storm centers and cold fronts. In several cases the arrival of a migratory wave appears to have been delayed by the passage of an extensive storm through the region. At least two minor waves were classified

as arrested waves, that is, the migrating birds were grounded by adverse weather in the Chicago area. On two occasions a considerable flight of birds preceded the change in surface wind direction to NW, and, therefore, arrived in advance of the time when an observer would normally have expected the arrival of birds flying with the NW wind following the passage of an advancing cold front.

An advancing cold front is characterized by more or less interfingering of air currents. In some cases an air current from the NW overlies at no great height a SW surface wind. Such a condition might explain the arrival of a migration wave before the surface wind shift. Some cold fronts move slowly or stop advancing, and migrating birds might fly on into the zone of southerly winds, beyond the surface wind shift line of the cold front. Atmospheric conditions along slow moving or stationary cold fronts are usually not turbulent, and cloud conditions and lack of precipitation may permit the flight of birds.

Complex Weather of September—October, 1946

The weather record for the north-central states in September and October, 1946, was complex. A number of storm centers passed through the Chicago region or west of it. Four of them were followed by cold fronts that caused no shift to NW or N winds at Chicago. Six cold fronts from the northwest or north died out in central or southern Wisconsin, and two others lost force and became static as they reached Chicago, their progress stopped by storms developing in or passing through the central states. Only five cold fronts from the northwest or north passed through the Chicago region with any force, and some of these were mild.

This was naturally an autumn of few bird migration waves in the Chicago region. The eight cold fronts that died out or lost force as they reached central and southern Wisconsin undoubtedly brought many migratory birds into the region not far north and northwest of Chicago. Such concentrations of migrants would disperse gradually as the birds continued their migration southward. This is indicated by the very irregular record of birds in Lincoln Park during these months. The first September cold front with NW to N wind reached Chicago on September 28, and as a result the counts of species migrating largely during the last half of September and early October were low, and their median dates were late. (The median date is the date on which the season count of a species reached half of the season total.) In October, four cold fronts reached Chicago and six others died out or lost force in southern and central Wisconsin. So the counts of species migrating principally in October were relatively large.

Western Palm Warbler Migration

	1946	1947	1948	1949	1950
Total count	315	1055	1476	559	240
Median date	Oct. 8	Oct. 2	Sept. 19	Oct. 1	Oct. 4

The Western Palm Warbler (*Dendroica p. palmarum*) nests from northern Minnesota north along the west side of Hudson Bay to northern Manitoba, and west to the Mackenzie Valley and casually to Alberta. With static weather the birds migrate leisurely southward through the Missouri and Mississippi valleys and the bulk of the migrants probably pass through the region west of Chicago. The year 1950 was an extreme example, with no cold fronts with strong NW winds invading the north-central states during September. During this period the daily count of Palm Warblers never exceeded 20, and the total was small. The early October cold fronts were too late in the migration period of the Palm Warbler to be accompanied by great flights, the peaks being 25 on Oct. 3 and 55 on Oct. 9. So the total count for 1950 was low chiefly because of the sequence of weather, and particularly the lack of strong NW winds during the first half of the Palm Warbler migration period.

The year 1948 was an opposite extreme. A cold front followed by strong NW winds swept down from Alberta at the very beginning of the migration period of the Palm Warbler. This favorable wind brought a great flight of these warblers into the Chicago region, with counts of 134 and 150 on September 9 and 10. Many of the arriving birds must have remained for a considerable period of time, departing gradually. This same cold front must have brought comparable flights into the region to the north along the west side of Lake Michigan, and there was probably an unusual concentration of Palm Warblers along the west side of Lake Michigan as a result of its barrier effect. So in the days that followed a large number of birds were migrating south through the Chicago area, and each succeeding cold front (on September 13, 20, and 30) was followed by a sharp increase in the daily count. From September 11 to October 4, the average daily count was 41. The net result was that the strong cold front from the NW at the very beginning of the Palm Warbler migration resulted in a large total count for the season.

The year 1947 was similar. The migration as a whole was late that year, as will be pointed out later. A prolonged heat wave was finally ended on the evening of September 14 by a cold front followed by a migration wave on September 15, including 23 Palm Warblers. A week later a strong cold front swept down from northwest Canada, bringing a wave of Palm Warblers with a count of 140 on September 22 and an average daily count of 46 for 16 days thereafter. The result was a season total much above average.

The total count in 1949 was intermediate. The early cold fronts on September 13 and 19 were mild and not accompanied by waves of fall migrants. A stronger cold front on September 27, bringing peaks of 45 and 50, was evidently too late to be accompanied by a great wave of Palm Warblers.

The complexity of the 1946 autumn weather has been discussed. No cold fronts with NW or N winds reached Chicago in September until September 28, with stronger cold fronts on October 7 and 11. The lack of strong cold fronts with favoring NW winds during September resulted in a low count of Palm Warblers for that year.

Myrtle Warbler Migration

	1946	1947	1948	1949	1950
Total count	955	528	1426	1942	713
Median date	Oct. 4	Oct. 3	Oct. 4	Oct. 7	Oct. 13

The Myrtle Warbler breeds westward to Alberta, British Columbia, and Alaska. The years of highest counts are those marked by cold fronts with strong NW winds during late September and early October, but this relation is not as striking as in the case of the Palm Warbler. Important waves of Myrtle Warblers do not appear so early as those of the Palm, the migration of the former under the most favorable conditions being somewhat later. Day to day observations show that Myrtle Warblers remain in Lincoln Park longer than Palm Warblers, probably because of more favorable feeding conditions for the Myrtle Warbler in the park. If a wave of Myrtle Warblers arrives early in the migration period of the species, the daily count generally continues near the peak for four or five days.

A strong NW cold front on September 21, 1949, caused successive daily counts of 75, 60, 75, and 75. The next NW cold front on September 27 was followed by an average daily count of 61 for seven days. These strong cold fronts in 1949 early in the Myrtle Warbler migration period, coupled with four later cold fronts in October, were mainly responsible for the high season total. In 1948, the September weather was static after the September 8 cold front that brought the big Palm Warbler wave. From September 20 to 29 a NE wind blew continuously, with a gradual increase in Myrtle Warblers; then a strong cold front October 1 resulted in a count of 622 in eight days. Later cold front periods added their quotas and so the 1948 count was large.

The extremely low 1947 count was connected with the prolonged heat wave until mid-September. The big Palm Warbler wave followed the September 21 cold front, but conditions during the next two weeks resulted in only a small migration of Myrtle Warblers at Chicago. The static September weather of 1950 resulted in an early scarcity of Myrtle Warblers even more

pronounced than in the case of the Palm Warbler. Most of the birds came with cold fronts in the last half of the normal migration period on October 2, 7, 11, and 19. The season count was low and the median date later than usual.

Migration of Sparrows

	1946	1947	1948	1949	1950
White-throated Sparrow					
Total count	1436	2181	2000	1656	1116
Median date	Oct. 8	Oct. 8	Oct. 9	Oct.4	Oct. 7
White-crowned Sparrow (*Zonotrichia leucophrys*)					
Total count	162	179	136	64	20
Median date	Oct. 12	Oct. 2	Oct. 8	Oct. 5	Oct. 9
Fox Sparrow					
Total count	393	224	456	233	207
Median date	Oct. 8	Oct. 16	Oct. 19	Oct. 11	Oct. 14
Slate-colored Junco					
Total count	3465	4204	5185	2105	2076
Median date	Oct. 21	Oct. 24	Oct. 22	Oct. 18	Oct.20
Tree Sparrow					
Total count	143	279	1074	51	101
Median date	Nov. 2	Nov. 2	Nov. 1	Nov. 3	Nov. 3

The sparrows listed nest north to the limit of trees and the Tree Sparrow beyond in the barren grounds. They (excluding western subspecies probably not involved in this study) breed west to Alberta and the Mackenzie Basin, the Slate-colored Junco and Fox Sparrow extending on to northwestern Alaska. Their migration through the Chicago region would be expected to follow in general the Palm Warbler pattern. With static weather the birds would migrate at a leisurely rate southward and most of the birds nesting in the western part of their breeding range would pass west of Chicago. But cold fronts sweeping down from the northwest during the early part of their migration periods would result in shifting more of these western birds into the area east of the Mississippi, and the barrier effect of Lake Michigan would be effective in causing concentrations along the western shore.

The big Palm Warbler years were 1947 and 1948 because of strong cold fronts from the northwest early in their migration period. For much the same reason these were also the years of great abundance at Chicago of the northern nesting sparrows. The low sparrow counts in 1949 and 1950 were connected with the warm autumn weather in both years. October 1949 was the warmest October of record at Chicago and October 1950 the second warmest. In both years there were few strong cold fronts during the period September 15 to October 15. The percentage of days with southerly and easterly winds was unusually high. The count of juncos was 100 or more on

only two days in 1949 and six days in 1950, compared with 27 days in 1948 and 19 days in 1947.

The large sparrow counts in 1947 and 1948 resulted from a succession of strong cold fronts. The 1947 sequence was most favorable for the White-throated Sparrow; beginning with the September 21 cold front that brought the big wave of Palm Warblers, the White-throats reached a peak of 225 on September 30, when the junco migration had barely begun. In 1948 the weather sequence favored the juncos, which were very abundant until mid-November; and also the Fox Sparrow, whose median date was later than usual. No explanation is apparent for the relative scarcity of Fox Sparrows in 1947. The large 1946 count of Fox Sparrows was the result of very large counts following cold fronts on September 28 and October 7.

Tree Sparrows are abundant in Minnesota and Iowa during the fall migration. This species seems to prefer to migrate through the more open country west of Chicago. It was counted in large numbers only in 1948, when the cold front sequence apparently caused many sparrows nesting in the western part of their species' breeding ranges to migrate farther to the east than usual. The Tree Sparrow is a late migrant and in each year the principal flight came with a cold front around November 1. The high count in 1948 resulted largely from a cold front on October 22, followed by a peak count of 100 and average daily counts of 51 for eight days, and a cold front October 31 with peaks of 100 and 155 and an average of 71 for seven days. The highest daily count of the other four years was 40.

Other Important Late Migrants

	1946	1947	1948	1949	1950
Hermit Thrush					
Total count	234	316	456	248	332
Median date	Oct. 13	Oct. 13	Oct. 11	Oct. 5	Oct. 11
Brown Creeper					
Total count	98	159	257	171	138
Median date	Oct. 19	Oct. 19	Oct. 8	Oct. 12	Oct. 10
Ruby-crowned Kinglet (*Regulus calendula*)					
Total count	246	181	142	230	146
Median date	Oct. 11	Oct. 19	Oct. 16	Oct. 12	Oct. 16
Golden-crowned Kinglet					
Total count	888	1414	237	873	754
Median date	Oct. 17	Oct. 19	Oct. 16	Oct. 12	Oct. 16

The migration of the Hermit Thrush in the Chicago region resembles that of the Palm Warbler and the sparrows mentioned above. The peak counts of 40 to 60 birds all resulted from strong cold fronts from the northwest on October 13, 1947, October 1, 8, and 16, 1948, and October 7 and 11, 1950.

The average daily count was high after each of these waves, as some of the birds apparently remained in the park for a week or more. The cold front of September 27, 1949, brought a moderate flight of Hermit Thrushes, but there were no later cold fronts of consequence until October 21, so the 1949 count was low. The 1946 record was similar, a September 28 cold front bringing some Hermit Thrushes, but few came into the park with the cold fronts of October 7 and 11.

The migration of the Brown Creeper is definitely associated with air masses sweeping down from the northwest and north. The strong cold fronts during October generally bring small flights with peak counts of 10 to 20 birds. The record resembles those of other October migrants, with the highest count in 1948.

The record of the Golden-crowned Kinglet shows an average yearly count of 833, with notable departures from this average only in the 1947 count of 1414, and the extremely low 1948 count of 237. This is remarkable because the autumn of 1948 was characterized by a succession of strong cold fronts and peak or near-peak counts of all other late migrants. The eastern race of the Golden-crowned Kinglet nests from Manitoba and Minnesota eastward. The fact that this kinglet was so scarce in 1948 suggests that many of the birds that ordinarily migrate down the west side of Lake Michigan were deflected to the east of their usual route by the weather succession. The migration of these kinglets may ordinarily involve a southwesterly movement around the west end of Lake Superior, and perhaps a migration from the northeast through the Sault Ste. Marie region and thence down the west side of Lake Michigan. The 1948 migration period was unfavorable for such southwesterly movements.

The unusually large 1947 count of Golden-crowned Kinglets may have been related to the prevailing easterly winds in the Lake Superior region during late September and October. At Sault Ste. Marie the October hourly wind record was 63% SE to NE and 20% W to NW; at Duluth the record was 55% E to NE and 18% W to NW. In 1947 the Golden-crowned Kinglet was first seen in Lincoln Park on September 25, and arrived in force on September 30. The waves of Golden-crowns were associated with other migrants that accompanied NW to N cold front winds.

Early Migration Period

The migration of the warblers is presented as representative of the early part of the fall migration (excluding the late migrating Palm and Myrtle warblers already discussed). The warblers comprise the great majority of all migrating land birds at Chicago during August and much of September.

Most warblers do not remain in their northern nesting grounds until driven south by cold weather. The migration of most species begins in late July or early August. This applies both to northern nesting birds and those nesting farther south. The Yellow Warbler (*Dendroica petechia*), for example, leaves its nesting areas around Chicago in late July or early August, and birds nesting farther north migrate through the region during August. This is in the hot part of summer when insect food is most abundant. The Yellow Warbler is not common at Chicago in September.

TABLE 4

SUMMARY OF TOTAL WARBLER COUNT 1946–1950
(*Exclusive of Palm and Myrtle Warblers*)

	1946	1947	1948	1949	1950
Aug. 1–10	0	7	27	0	15
11–20	32	3	212	3	46
21–31	565	162	981	518	241
Sept. 1–10	1,131	465	1,557	1,500	1,485
11–20	788	822	1,760	1,074	1,118
21–30	695	384	534	458	612
Oct. 1–10	106	203	87	179	197
11–20	37	35	22	40	15
21–31	8	11	2	11	0
November	4	5	3	0	0
Totals	3,366	2,097	5,185	3,783	3,729
Median Date	Sept. 10	Sept. 15	Sept. 10	Sept. 10	Sept. 11

The warbler migration begins during the summer period of static weather and much of the migration passes in most years before the strong cyclonic circulation of autumn is well established, as already pointed out. Most summer cyclones and anticyclones are not strongly developed circulations, and the summer cold fronts are ordinarily mild. But there are exceptions; great masses of cool Arctic air do sometimes sweep down from the north during the summer. An important cold front at the beginning of August in 1948 appears to have had a profound effect on the autumn migration in that year; in 1947 the lack of any strong cold fronts until mid-September made that a year of opposite extreme.

A summary of the warbler count for each year is given in Table 4. The average number of warblers counted, exclusive of Palm and Myrtle, was 3,632 per year. The counts in 1946, 1949, and 1950 were about average, with a notably high count in 1948 and a very low count in 1947. The median dates were remarkably uniform, except 1947, which was a little late. The

record of the more abundant species is given in Table 5, with median dates. The census of the uncommon warbler species with median dates for all birds seen during the five years, is as follows:

	1946	1947	1948	1949	1950	Total	Median Date
Prothonotary (*Protonotaria citrea*)	—	—	2	—	—	2	Aug. 13
Louisiana Water-thrush (*Seiurus motacilla*)	3	11	17	—	—	31	Sept. 1
Canada (*Wilsonia canadensis*)	22	10	7	4	3	46	Sept. 1
Mourning (*Oporornis philadelphia*)	3	3	—	—	—	6	Sept. 5
Golden-winged (*Vermivora chrysoptera*)	1	—	4	—	—	5	Sept. 7
Connecticut (*Oporornis agilis*)	2	5	2	—	4	13	Sept. 7
Parula (*Parula americana*)	3	1	—	3	—	7	Sept. 15
Pine (*Dendroica pinus*)	—	1	5	—	—	6	Sept. 16
Kentucky (*Oporornis formosus*)	—	1	—	—	—	1	Sept. 16
Black-throated Blue (*Dendroica coerulescens*)	13	7	11	—	15	46	Sept. 22
Orange-crowned (*Vermivora celata*)	20	14	1	28	10	73	Oct. 13

The season counts of warblers and other species correctly show the relative frequency of observation, but not the actual abundance of the birds. For example, the Redstart finds the park a congenial place to linger, and many individuals probably do remain for a week or more. But the Blackburnian always appears to be in haste to move on. So the total five-year Redstart count of 4,571 does not mean that it is about 14 times more abundant as a fall migrant than the Blackburnian, with a total count of only 335. The large season counts give an exaggerated picture when compared to the low counts, as regards actual abundance. This applies not only to comparisons between species, but also to comparisons of large and small yearly counts of the same species.

Early Migration Period in 1947

The upper Mississippi Valley region experienced a heat wave in the late summer of 1947. The average August temperature at Chicago was 8.6° above normal and for 14 stations farther north from Alpena, Michigan, to Williston, North Dakota, the average was 7.0° above normal. The heat wave continued in September with equally abnormal temperatures, until finally broken by

TABLE 5

CENSUS RECORD OF THE ABUNDANT WARBLER SPECIES

Total season counts and median dates

	1946	1947	1948	1949	1950	5-yr. period
Yellow	20	35	160	24	58	297
(*Dendroica petechia*)	Aug. 14	Aug. 24	Aug. 17	Aug. 29	Aug. 14	Aug. 18
Blackburnian	103	31	95	41	65	335
(*Dendroica fusca*)	Sept. 1	Sept. 7	Sept. 2	Sept. 6	Sept. 4	Sept. 3
Wilson's	19	19	40	16	61	155
(*Wilsonia pusilla*)	Sept. 2	Sept. 8	Sept. 8	Sept. 1	Sept. 4	Sept. 5
Tennessee	263	127	211	232	261	1,094
(*Vermivora peregrina*)	Sept. 8	Sept. 11	Aug. 29	Sept. 6	Sept. 8	Sept. 7
Northern Water-thrush	187	226	392	332	140	1,277
(*Seiurus noveboracensis*)	Sept. 5	Sept. 10	Sept. 3	Sept. 12	Sept. 1	Sept. 8
Black and White	175	102	307	120	70	774
(*Mniotilta varia*)	Sept. 3	Sept. 13	Sept. 11	Sept. 8	Sept. 1	Sept. 9
Redstart	768	661	1,421	967	754	4,571
(*Setophaga ruticilla*)	Sept. 7	Sept. 16	Sept. 7	Sept. 6	Sept. 14	Sept. 10
Blackpoll	554	196	743	641	681	2,815
(*Dendroica striata*)	Sept. 16	Sept. 16	Sept. 8	Sept. 10	Sept. 11	Sept. 11
Bay-breasted	50	10	172	127	185	544
(*Dendroica castanea*)	Sept. 15	Sept. 26	Sept. 12	Sept. 12	Sept. 10	Sept. 11
Cape May	153	28	253	204	420	1,058
(*Dendroica tigrina*)	Sept. 12	Sept. 21	Sept. 9	Sept. 10	Sept. 12	Sept. 11
Magnolia	379	223	547	330	364	1,843
(*Dendroica magnolia*)	Sept. 10	Sept. 20	Sept. 11	Sept. 9	Sept. 9	Sept. 11
Chestnut-sided	160	45	136	150	113	604
(*Dendroica pensylvanica*)	Sept. 20	Sept. 21	Sept. 14	Sept. 8	Sept. 10	Sept. 13
Ovenbird	66	92	165	104	47	474
(*Seiurus aurocapillus*)	Sept. 12	Sept. 16	Sept. 15	Sept. 19	Sept. 13	Sept. 15
Black-throated Green	199	160	275	192	189	1,015
(*Dendroica virens*)	Sept. 10	Sept. 22	Sept. 18	Sept. 17	Sept. 12	Sept. 17
Northern Yellow-throat	103	40	114	112	86	455
(*Geothlypis trichas*)	Sept. 21	Sept. 15	Sept. 15	Sept. 18	Sept. 15	Sept. 17
Nashville	100	49	105	256	203	713
(*Vermivora ruficapilla*)	Sept. 14	Oct. 4	Sept. 21	Sept. 22	Sept. 11	Sept. 19

a cold front that reached Chicago in the late evening of September 14. During all of this long period the Mississippi Valley region was invaded by no important cool air masses from the north; there were no strong cold fronts. The similar weather in the New York and New England regions, and its effect on bird migration, has already been referred to.

The early migration period at Chicago was uneventful as a result of this abnormal period of late summer heat. There were no migration waves prior to the arrival of the September 14 cold front. Only 17 warblers were counted prior to August 24, all Yellow Warblers. Later the count of warblers in-

creased slowly to 52 on August 31 and 90 on September 8, but the census area count did not reach 100 until September 15, when the first strong cold front from the northwest brought a moderate increase, including the first Palm Warblers (23) and a few White-throated Sparrows and kinglets. The next strong cold front, on September 22, brought the wave of 140 Palm Warblers and the first important appearance of Myrtle Warblers, White-throated Sparrows, Fox Sparrows, juncos, and Hermit Thrushes. The season count of warblers (excluding Palm and Myrtle) was extremely low because of the unusual weather conditions up to mid-September. Under static conditions the birds evidently moved south leisurely, making many short flights instead of mass movements stimulated by cold front winds. Large concentrations did not accumulate along the west side of Lake Michigan or elsewhere in the region. The median dates were late.

Early Migrations of 1948 and 1950

The extremely large warbler count (excluding the Myrtle) in 1948 is interpreted as having its origin in the southward movement of a great mass of cool northern air during the first week of August. This and a favorable later weather sequence resulted in a large concentration of warblers in the Chicago region from late August into early October. The warbler count in Lincoln Park exceeded 100 on every day from August 28 to October 4, with a peak of 437 on September 19. The Arctic air mass accompanied a High that appeared on the coast of northwest Mackenzie on July 31, moving southeast to Lake Winnipeg (Aug. 4) and eastern Kentucky (Aug. 7). Northerly winds prevailed over a great area in Canada and the north-central United States during this period, with light frosts in Canada and the Lake Superior region and a low of 51° at Chicago (Aug. 6). Large numbers of warblers probably took advantage of the northerly winds to make migratory flights southward from their nesting grounds. Then the migration continued at a slow rate, except as accelerated by cold fronts reaching Chicago on August 18 and 22. The total warbler count to August 20 was 239, compared to an average of 27 for the other years. The August total was 1220, the average of the other years 398.

Reference has been made to the strong cold front that reached Chicago on September 7, 1948. The early wave of Palm Warblers that followed this cold front was also probably an aftermath of the Arctic air mass that moved southward in early August. The weather sequence, and particularly the strong early September cold front, apparently caused a large southeast movement of warblers, with concentration along the west side of Lake Michigan. Two weeks of warm static weather followed in September, and through-

out this period the daily count of warblers in Lincoln Park was unusually large, averaging 229.

The central and eastern parts of North America were also invaded by a great mass of Arctic air during August, 1950. A strong High appeared in northwest Canada on August 15, one center moving to Georgian Bay (August 18) and east, followed by the principal High center moving from northern Alberta (August 17) to Kansas (August 20) and east. The cold front reached Chicago in the evening of August 17, and was followed by four days of NW wind with morning temperature 48° to 46°, these being the lowest ever recorded at Chicago in August. There were frosts in the Canadian prairie provinces that did great damage to the wheat crop; there were also frosts in the Lake Superior region. In all this area no such August cold wave had ever been recorded before, and everywhere it was accompanied by a long period of NW wind.

This northern air invasion came in mid-August, when the slow southward migration of northern nesting warblers was in progress. It must have caused an early concentration south of their nesting grounds, with the usual shift to the southeast. But the effect of the early cold front was largely dissipated during a seven-week period of summer weather that followed, broken only by a moderate cold front that reached Chicago on September 3, with a warbler count of 185 the next morning. The warbler count averaged 155 during the first 14 September days, but was very low during the last half of the month, exceeding 100 on only three days. So, the 1950 total was only about average.

Migration of Early Warbler Species

A satisfactory analysis of the record of most of the warbler species is impossible because no adequate information is available concerning either the relative abundance of the warblers in different parts of their breeding ranges or their southward migration routes from the different breeding areas. The possibilities of migration across or around Lake Superior, and of westward migration from Ontario through the Sault Ste. Marie area to Upper Michigan and then south through Wisconsin, cannot be evaluated. The variations in season counts of each species have been studied, and also the same figures reduced to a percentage of the total warbler count for the season. Only a few generalizations appear to be justified.

The large season counts of the abundant early migrating warblers are interpreted as related closely to strong NW cold fronts, just as in the case of the later Palm and Myrtle warblers. This seems to be especially true of at least some of the species whose breeding ranges extend far to the west and northwest in Canada and, in some species, even into Alaska, particularly the

Blackpoll, Yellow, Wilson's, Bay-breasted, and Cape May warblers. Above average counts of these are evidently due largely to a favorable sequence of strong cold fronts, with southeast shift of migrants from the western parts of their breeding ranges.

The Yellow Warbler migrates early, during the late summer period of ordinarily static weather. The count was small in all years except 1948, when the exceptional, strong NW cold front at the beginning of August evidently caused a considerable eastward shift and concentration along the west side of Lake Michigan. As a result the 1948 count exceeded the combined total for the other four years. The next largest count, in 1950, was evidently caused by the strong NW cold front in mid-August, which came too late in the Yellow Warbler migration to be as effective as the earlier cold front in 1948.

The 1950 counts of Cape May, Wilson's, and Bay-breasted warblers were larger than in any other year, and of Blackpolls not much less than in 1948. The Nashville Warbler was very abundant and much earlier than usual. Each of these species comprised a larger percentage of the total warbler count than in any other year. The mid-August 1950 cold front must have caused a southeast movement of these species. The 1947 counts of Blackpoll, Cape May, Bay-breasted, and Nashville warblers were lower than in any other year, both in numbers and percentages of total warblers, which contrasts with the large totals of 1950 and 1948, when early cold fronts favored their migration through the Chicago region.

Summary

This paper is a regional study of grounded night migrants, based on a daily census of birds in Lincoln Park, Chicago, during the autumn migrations of 1946 to 1950 inclusive. The writer concludes that the bird waves that characterize the autumn migrations, the wide variation in the season counts of the abundant species, and other features of the census record are due chiefly to variable weather conditions, and particularly to the invasion of the north-central states by cold fronts, followed by periods of strong northerly winds. During the five-year study period, without exception, every important autumn bird wave was associated with an advancing cold front. As a rule the big migration waves of a given species accompanied cold fronts in the early or middle part of that species' migration period. In each year the great bulk of the migration had passed Chicago even before the first freezing temperature occurred at Chicago, and before temperatures more than a few degrees below freezing had occurred at Winnipeg or anywhere south of Lake Superior. The birds seen later were chiefly Slate-colored Juncos, Fox Sparrows, Tree Sparrows, and Golden-crowned Kinglets.

The autumn migration waves are associated with cold fronts followed by strong NW to N winds. Cold fronts followed only by strong NE winds never brought migration waves to Lincoln Park and the census study produced no other evidence that birds migrate westward across Lake Michigan in any appreciable numbers. Conversely, it is believed that marked concentrations of birds migrating southeastward with NW winds occur along the west side of Lake Michigan. This results in a large count of birds at Chicago during subsequent days if later weather conditions do not cause a quick dispersal of the concentration. The large season counts of migrants passing through Lincoln Park are believed to be due chiefly to the southeast shift of birds migrating with NW winds, and resulting concentrations due to the barrier effect of Lake Michigan. Static weather conditions during the early and middle part of a species' migration period normally results in a low season count.

The migration of warblers (excluding the late-migrating Palm and Myrtle warblers) is presented as representative of the early part of the fall migration, which begins during the late summer period of normally static weather conditions. Much of the early migration usually passes before the strong cyclonic circulation of autumn is well established, generally about mid-September. But the early migrants do take advantage of any favoring cold front winds in their southward migration. Early cold fronts in late August and early September were always followed by important warbler migration waves. Above average warbler counts are evidently due largely to a favorable sequence of early cold fronts, with southeast shift of migrants from the western parts of their breeding ranges, just as in the case of the later migrants.

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NEW BIRDS FOR THE STATE OF MICHOACAN, MEXICO

BY GEORGE MIKSCH SUTTON

FROM mid-December, 1948, to the end of March, 1949, Roger P. Hurd, of Millerton, Pennsylvania, and I visited several parts of Texas and México studying birds. From December 19 to January 6 we journeyed down the Texas side of the Rio Grande from Laredo to Brownsville. From January 6 to 29 we were in Tamaulipas—for several days at the Mesa de Llera, on the main highway just south of Victoria, and for about two weeks at Pano Ayuctle (Pumpkin Ford) on the Río Sabinas, not far from the hill village of Gómez Farías. Leaving Tamaulipas on January 29, we went to Lake Pátzcuaro, Michoacán. Our route took us through the cities of Querétaro, Celaya, Salamanca, and Morelia.

We remained in Michoacán from February 2 to March 10, working (1) along the Guadalajara highway about 11 kilometers west of the village of Quiroga, in pine forest at about 7500 feet elevation, February 2 and 3; (2) along the Tacámbaro highway 9 kilometers south of the city of Pátzcuaro, in oak-pine forest at about 8000 feet elevation, February 4 to 18; (3) about the village of Erongarícuaro, on the shore of Lake Pátzcuaro, February 19 and 20; (4) near the Estación Limnológica at the edge of the city of Pátzcuaro, February 21 to 23; (5) again along the Guadalajara highway 11 kilometers west of Quiroga, February 24 to 28; (6) along the Tacámbaro highway 29 kilometers south of Pátzcuaro, among firs and pines at about 10,000 feet elevation, February 28 to March 4; and (7) near the village of Chupio, along the Río de la Alberca, about 12 kilometers south of the city of Tecámbaro, March 5 to 9.

All but the last of the above-named localities were in or at the edge of the Pátzcuaro basin, but the Río de la Alberca is a tributary of the Mexcala (Balsas), and the country about Chupio was unlike any I had seen previously in México. Our campsite was near the point at which the Río de la Alberca, a small, swift stream, plunged into a deep gorge, there to become invisible for several hundred yards. Trees grew along the river proper, but back from the precipitous banks the ground was dry, rocky, and thinly covered with grass and shrubbery. Upstream a quarter of a mile, we ascended a dry tributary gorge to the level of the oaks and pines. Many of the lowland birds were wholly unfamiliar to me—among them a conspicuous, duet-singing, black-chested finch, which proved to be *Aimophila humeralis*; a hummingbird with boldly white under parts—*Amazilia violiceps*; another hummingbird, *Amazilia beryllina*, a green-throated species, which swarmed about certain blossoming trees; a whip-poor-will which we never heard calling, even on moon-

lit nights—*Caprimulgus ridgwayi*; and that beautiful fringillid, Leclancher's Bunting (*Passerina leclancheri*). Collecting was difficult not only because the dry ground everywhere was very slippery, but also because so many birds lived exclusively in the trees above the deep, dangerous gorge.

On March 10 we left Michoacán, driving by way of Toluca to Mexico City, where we remained two days. On March 13 we ascended almost to snowline on Popocatepetl, remaining there overnight. On March 14 we drove northward as far as Jacala, Hidalgo, where we camped two days. Arriving once more at the Río Sabinas, in Tamaulipas, on March 17, we climbed afoot to the Rancho del Cielo (elevation 3300 feet), where we were the guests of Mr. Frank Harrison. On March 24 we drove north to Linares, Nuevo León. From March 25 to 28 we stayed at the Mesa de Chipinque, near Monterrey, Nuevo León. We crossed the border at Reynosa, Tamaulipas, March 30.

Dr. Ernest P. Edwards has made an intensive study of the birds of the Lake Pátzcuaro basin in recent years (see Edwards and Lea, 1950. "Notes on Birds of the Lake Pátzcuaro Region, Michoacán, México," *Condor*, 52: 260–271). I have obtained his entire collection from that region—several hundred specimens in all. His survey has given him an acquaintance with the birds of the State of Michoacán, and I had his provisional state-list with me in the field, one of my purposes being to obtain, whenever possible, species not listed by him. Most of the following birds have not, so far as we know, been reported hitherto from Michoacán.

Asio otus wilsonianus. American Long-eared Owl.

Just after nightfall on February 11 I collected a female Long-eared Owl not far from the Tacámbaro highway, 9 kilometers south of Pátzcuaro. It was very fat. In its stomach were some short fur and small mammalian bones. A largish owl which I saw the following night along the old Pátzcuaro trail near camp probably was of the same species.

Aegolius acadicus acadicus. Acadian Saw-whet Owl.

In broad daylight on February 7, Roger Hurd and I flushed a Saw-whet Owl from a thicket of small oaks growing on a slope at the edge of the Tacámbaro highway, 9 kilometers south of Pátzcuaro. To our surprise the bird flew into the open and alighted on a rock. It proved to be a female. It was not fat. Its stomach was empty. Incoming white or white-edged belly feathers, many of which were still partly sheathed at the base, were of the first winter plumage; the fully developed buffy brown feathers of the under parts were of the outgoing immature plumage. The specimen (GMS 10737) represents the nominate race.

Bombycilla cedrorum. Cedar Waxwing.

Recorded along the Tacámbaro highway 9 kilometers south of Pátzcuaro as follows: a flock of about 25, flying over, February 8; a small flock in an oak, February 10; a single bird, flying over, February 11; and a small flock, flying over, February 13. Recorded near the Limnological Station at the edge of the city of Pátzcuaro as follows: a

small flock in the top of a willow near the main road, February 21; a few birds flying along the lake shore, February 22; and a small flock in a tree on the Station grounds, February 23. I was able to preserve a specimen (sex ?) which I found dead at the side of a dirt road on February 23. The secondaries were without waxy tips.

Vermivora crissalis. Colima Warbler.

Edwards informs me that on March 18, 1948, in mixed woods 11 kilometers west of Quiroga, Paul S. Martin saw two of these birds. I collected a male among shrubbery at the edge of pine-oak woods, 29 kilometers south of Pátzcuaro, a quarter of a mile from the Tacámbaro highway, March 2, 1949. The testes of this specimen were very slightly, if at all, enlarged.

Icterus abeillei. Abeillé's Oriole.

This handsome oriole was fairly common among the firs near our camp 29 kilometers south of Pátzcuaro in late February and early March. It may also have been common among the oaks and pines 9 kilometers south of Pátzcuaro, February 4–18, but during that period I was not familiar with the various plumages of the species and was, in consequence, confused by many of the female and subadult orioles which I did see. On February 17 I collected a subadult male *I. abeillei* (testes unenlarged) which was female-like in general appearance save for the narrow jet black throat-patch and a glossy black patch at either side of the chest. Among firs, giant flowering *Salvia*, and astoundingly tall thistles 29 kilometers south of Pátzcuaro, I took the following specimens: a subadult male with narrow black throat-patch but no black on the sides of the chest, February 18; an adult female, with a suggestion of black in the middle lower throat, March 2; and a fully adult male, March 3. All of these specimens had a pitch-like substance on their toes. On March 4, I was surprised to encounter among the firs several roving flocks composed largely of adult males. One bird which I watched for some time pounded with its bill a good-sized object held in one foot in the manner of a jay or a titmouse.

Piranga ludoviciana. Western Tanager.

We recorded this species near camp along the Tacámbaro highway 9 kilometers south of Pátzcuaro on February 10 (one bird) and February 13 (one bird), and along the Río de la Alberca, near Chupio, on March 5 (two birds), March 6 (several birds, one female of which I collected), March 7 (two birds), and March 9 (several birds). This species has been reported from Michoacán, but no specimen has heretofore been collected.

Chondestes grammacus. Lark Sparrow.

We noted this species as follows: a few along the highway not far from Morelia, February 2; several near the city of Pátzcuaro, February 3; several along the Tacámbaro highway 9 kilometers south of Pátzcuaro, February 9 and 10; one along the Tacámbaro highway about 10 kilometers south of Pátzcuaro, February 11; and several along the Río de la Alberca, near Chupio, March 8. A male (wing, 90 mm., tail, 73) taken March 8 is referable to *C. g. grammacus.* The general tone of the upper parts is darker than in a considerable series of *C. g. strigatus* at hand, and the chestnut markings of the head are fully as dark as those of the Michigan and West Virginia specimens in my collection. The Lark Sparrow has not, apparently, heretofore been collected in Michoacán.

DEPARTMENT OF ZOOLOGY, UNIVERSITY OF OKLAHOMA, NORMAN, JANUARY 30, 1952

BELL'S VIREO IN INDIANA

BY RUSSELL E. MUMFORD

THE paucity of published data concerning the status of the Bell's Vireo (*Vireo bellii*) in Indiana has prompted this note. During the past ten years, other persons and I have observed the bird in a number of areas over the state. It thus seems advisable to bring all of the records up to date. The records indicate that Bell's Vireo is well-established over a considerable portion of Indiana.

Bent (1950:254) says: "The species, *Vireo belli*, is widely distributed over the western United States and northern Mexico, but the type race is found only east of the Rocky Mountains, from southern South Dakota, northern Illinois, and northeastern [this probably was meant to be northwestern] Indiana to eastern Texas and Tamaulipas." Butler (1897:1179) carried the bird on the hypothetical list for Indiana but noted that Nelson took a specimen at Chicago in 1875. A young female which I collected near Lafayette, Tippecanoe County, Indiana, on August 10, 1951, appears to be the first Indiana specimen. All reports of Bell's Vireo from Indiana known to me (although I have probably missed some unpublished records) are presented, by years, below.

1943

A search of the literature has failed to reveal any Indiana record prior to the one reported by Mrs. W. E. Dittrich (Wright, 1949:54). She saw one at Highland, Lake County, Indiana, on April 30. Charles T. Clark found two Bell's Vireos at Camp Pottawotamie, Tippecanoe River State Park, on July 4. He wrote (in letter), "I heard one singing in some thickets . . . spent the better part of a half hour "running" it down. Finally obtained very close and satisfactory views."

1944

Clark found two birds on the Jasper-Pulaski State Game Preserve, Medaryville, Indiana, July 16. This information was relayed (by letter) to O. D. McKeever shortly thereafter, but was never published. The birds were located "just east of the road bordering the Bob-white pen section," according to Clark (letter to me).

1945

The next record was submitted by Dr. W. E. Ricker (Wright, 1948:48) from the Tippecanoe River State Park. He said, "Saw one pair of Bell's Vireos at Tippecanoe River State Park near Winamac [Pulaski County] in 1945. They raised a young cowbird [*Molothrus ater*] which I saw them feeding. Original identification was made by a local ornithologist of Knox." Clark, who was residing in Knox at this time, informed me by letter that he did not discover this nest. Unfortunately, we are unable to give credit for the first nesting record for the state.

1946

On May 13, Mrs. Dittrich reported Bell's Vireos from Highland. Bell's Vireo was first noted in Marion County that year, also, by Dale W. Rice and several others. They saw two on May 30, at the Geist Reservoir, near Indianapolis, "in a tangled thicket near the water's edge." Val Nolan, Jr., saw Bell's Vireo in this county on June 1, and on June 23, Charles Keller found a young one just out of the nest. The only other 1946 record was of four birds seen by Clark on July 6 at Jasper-Pulaski State Game Preserve.

1947

Henry C. West observed a single individual in Marion County on April 19, near the junction of Fall Creek and White River (in Indianapolis) in some "2nd, 3rd, and 4th year saplings of . . . willow" (West, letter).

Dittrich reported it from Highland on May 31. On May 29, Clark, T. J. Nork, and Richard Zusi found a nest in a willow (*Salix* sp.) at the Jasper-Pulaski State Game Preserve. The nest contained two eggs and two young.

1948

Bell's Vireo was found in the same three counties where it was recorded the previous year. It was observed at three different localities in Marion County and Rice found a nest there containing one egg on June 14. West reported single birds on April 17 and 24, in Marion County. The third was a bird heard singing by Rice in a "scrub-grown abandoned pasture" (Rice, 1948:18) on June 7, probably a breeding bird. It was noted at Highland by Dittrich on May 16 and Clark observed two on the Jasper-Pulaski State Game Preserve on May 21.

1949

On April 21 and 25, Bell's Vireo was reported in Lake County by Dittrich. There were nesting records from Marion County that year "in two of the same places . . . where it was seen last year" (Wright, 1949:54). Nork and Zusi heard one singing at the Jasper-Pulaski State Game Preserve on June 26.

1950

I found a singing bird at Brazil, Clay County, Indiana, on May 22. I located the nest the following day. I heard another singing male one mile from this area during that summer. I also heard a singing male in Clinton, Vermillion County, on July 1.

Rice and Edward Mockford reported at least four birds at separate areas near Morocco, Newton County, in July. The first Tippecanoe County record was obtained on May 29, by Marvin Davis, Hubert Davis, and Richard Phillips. They found at least two males in the willow thickets surrounding some old gravel pits close to the Purdue University Campus, Lafayette.

Leonard Brecher informed me (in letter) that he had been shown a nest at the Jasper-Pulaski State Game Preserve in 1950, while on a hike with Nork and Clark. He further wrote, "We heard a number of singing birds in the area . . . ." Upon inquiry I learned that this nest had been observed on June 26 by Clark, Nork, Zusi, Brecher, and others. It contained three eggs on that date.

Rice reported that Bell's Vireo nested in Marion County again in 1950. Dittrich reported a bird in Lake County on October 9. In view of the migration dates listed by Bent (1950:262), this appears to be a late record.

1951

I found two pairs and five nests in Brazil, Indiana, in 1951. In addition, I also discovered two old nests on an area where none was found in 1950.

Dr. C. M. Kirkpatrick heard a singing bird near Lafayette in the spring of 1951, and I located the nest on June 20. At another site close to the above nest, Kirkpatrick and I heard at least one, and perhaps two, other singing males and found one nest. Four males were subsequently heard and observed by Kirkpatrick, Dr. I. W. Burr, M. S. Webster, and me at still another site, near the Purdue University campus, in a nursery. A nest was just being started on July 5, but was never completed. Persistent searching in the summer months, as well as in November, after the leaves had fallen, failed to disclose any nests. On July 14, I did find an old nest (evidently built in 1950) in this nursery, but in an area where no Bell's Vireo was present in 1951.

Clark reported the birds again at the Jasper-Pulaski State Game Preserve on May 19, and on June 3, James B. Cope and I observed a singing male there. It was still present in the same area on July 7, although we did not search for the nest.

1952

Records for 1952 which have come to my attention are as follows: Cope heard two singing males at the Jasper-Pulaski State Game Preserve on May 24. I found four birds at two different areas near Lafayette on May 24; both of these areas were occupied in 1951. A new locality was added to the list on May 30, when Kirkpatrick, Phillips, and I found a singing male in a dense thicket of quaking aspen (*Populus tremuloides*) near Schererville, Lake County, Indiana. On June 30, I heard a singing male on the new Willow Slough State Game Preserve, near Morocco, Newton County. The following day I found three additional males singing at widely separated areas in Newton County. These are likewise new sites in Indiana for this species.

Habitat

In Indiana, Bell's Vireo seems to prefer areas with an abundance of low shrubs, thickets, briar tangles, and ground cover. Abandoned fields grown up to sassafras (*Sassafras albidum*), hawthorn (*Crataegus* spp.), wild plum (*Prunus* spp.), elder (*Sambucus canadensis*), and similar plants seem to be favored. In the strip-mining of coal in Clay County, many such areas are produced; it is on these sites that Bell's Vireo nests. A considerable portion of southwestern Indiana is characterized by this type of habitat, but no field work has been done in most of it.

Brushy fencerows, almost a thing of the past in intensively farmed areas, are also utilized. Some of the birds located in Tippecanoe County in 1951 were nesting in thick, shrubby fencerows composed mainly of hazelnut (*Corylus* sp.), poison ivy (*Rhus toxicodendron*), elder, shingle oak (*Quercus imbricaria*), and raspberry (*Rubus* sp.). Where such conditions exist in the northwestern portion of the state, Bell's Vireo may be present.

On poorly-drained areas which were once marsh land, cessation of farming allows the regrowth of quaking aspen, willows, and dogwoods (*Cornus* spp.). Bell's Vireo occurs in these situations on the Jasper-Pulaski and Willow

Slough State Game Preserves, the Morocco areas, Tippecanoe River State Park, and in Lake County. There is a large amount of such habitat in northern Indiana, notably along the Kankakee River.

FIG. 1. Nesting habitat of Bell's Vireo at Brazil, Clay County, Indiana. A nest was found in the small tree in the foreground on May 23, 1950. Photographed by Russell E. Mumford.

The nest tree is usually close to, or a part of, dense cover, such as wild plum thicket, dogwood clump, hazelnut clump, or briar patch. Nine nest trees averaged 11 feet in height. Most of these trees were situated in the open at the edge of a thicket (see Fig. 1). Where the nest was in a fencerow or row of nursery trees, it was placed on the border and not in the dense, central portion. The ground cover of the openings where nests were located usually consisted of goldenrod (*Solidago* spp.), aster (*Aster* sp.), milkweed (*Asclepias* spp.), and other open field plants. Such ground cover reaches a height sufficient to obscure the lower branches of the nest tree. The nest is placed where the ground cover merges with the low, drooping branches of the nest

tree. Thirteen nests found in Indiana in 1951 were in the following kinds of trees: hazelnut, 3; white elm (*Ulmus americana*), 2 (both in same tree; second nest built after first nest deserted); hawthorn, 2; apple (*Malus* sp.), 2; black cherry (*Prunus serotina*), 1; sugar maple (*Acer saccharum*), 1; willow, 1; and elder, 1. Two other nests thought to have been constructed in 1950 were found in hawthorns, apparently one of the favorite nesting sites.

Nesting

Nesting apparently begins in mid-May in Indiana. I saw two birds building a nest at Brazil on May 13, 1951. A nest containing three eggs on May 26, 1950, at Brazil, probably was started about a week earlier. Another nest in the same area was completed on May 31, 1951. Clark found a nest containing two eggs and two newly-hatched young on May 29, 1947, at the Jasper-Pulaski State Game Preserve. This nest probably was started about May 11 or 12.

Most observers agree that incubation requires about 14 days (Bent, 1950: 257). Nest building was determined to last from four to five days by Pitelka and Koestner (1942:99) in Illinois. The young are said, by these same authors, to remain in the nest about 11 days.

The nest is placed low in the tree. Thirteen nests in Indiana examined by me ranged from 20 inches to 40 inches in height. The average measured height of eight nests was 31 inches (Table 1). Every nest that I examined was placed in the fork of a small branch; in one case it was in a lateral fork instead of being in a terminal fork. The distance from the main stem of the nest tree to the nest varied from 9 to 43 inches; average, 24 inches. Additional nest data are presented in Table 1.

Typical nests were well-made and neatly-woven cups. All of the eight nests collected bore a marked resemblance to one another. The outside of the nest was often woven from the inner layers of milkweed stems, and other grayish materials. Occasionally, shreds of birch (*Betula*) bark, grapevine (*Vitis* sp.) stem, dead leaves, and bits of paper were utilized in the outer covering. The nests were always lined with the fine, reddish-brown stems of grasses. Each nest was bedecked with spider webs and cocoons, evenly distributed over the outside wall of the nest. Similar nest construction has been reported by Holland, Du Bois, Nice, and Simmons (*in* Bent, 1950:254–256).

Behavior at the Nest

On two occasions, I found both adults taking part in the construction of the nest. Pitelka and Koestner (1942:102) reported that the female built the nest unaided, in the five nests studied by them in Illinois. On May 13, 1951, I spent a short time observing a pair of birds at work on the nest at Brazil.

TABLE 1

NESTS OF BELL'S VIREO IN INDIANA, 1943–1951

NEST NO.	HEIGHT FROM BOTTOM OF NEST TO GROUND	INSIDE DIAM.[1]	OUTSIDE DIAM.[1]	INSIDE DEPTH[1]	OUTSIDE DEPTH[1]	DISTANCE FROM TRUNK
1	about 20 in.					
2	about 36 in.					
3	23 in.	43 × 56	66 × 78	30	60	27 in.
4	40 in.	43 × 43	58 × 59	38	62	16 in.
5	22 in.	51 × 62	77 × 83	35	73	26 in.
6	36 in.	48 × 50	67 × 70	34	57	43 in.
7	28 in.	40 × 48	59 × 70	30	57	24 in.
8	28 in.	42 × 65	63 × 84	36	82	9 in.
9	about 30 in.					
10	40 in.	40 × 47	50 × 66	36	71	26 in.
11	30 in.					
12	about 36 in.					
13	"2¼ ft."					
Averages[2]	31 in.	44 × 53	63 × 73	34	66	24 in.

[1] Measurements in millimeters.

[2] Estimated heights not included in average.

The male was singing and I soon located him at the nest. He then left, returning in about a minute closely behind the female, which was carrying plant material. The female went directly to the nest, while the male flew into the nest tree and sang as the female worked on the nest. In a short time, the female flew from the nest, whereupon the male hopped down to it and appeared to be arranging the nesting material for several seconds. He then flew off low under the protection of an adjacent wild plum thicket in the direction taken by his mate. Soon both returned, the female with more nesting material, but the male with none that was visible. The same procedure was followed as before, except that this time the male sang as he was arranging the nest. Both birds left again. The female stayed away from the nest for the next few minutes, but the male returned four times and seemed to be adding something to it. This may have been spider silk, although it was not visible with a binocular from 60 feet away. On one of his visits, the male flew down to a leaning milkweed stem and unsuccessfully attempted to strip off some of the silky inner layers of the plant. Later, I saw both adults carrying nesting material from a point about 100 yards from the nest.

I hid near the above nest on May 21, 1951, to observe this pair. On this date the nest already contained two cowbird eggs and was hanging loosely

from its support. The male was singing near the nest at 9:30 a.m. At 9:35 a.m., a female cowbird alighted in the nest tree and was immediately chased away by the male vireo. As he flew after the cowbird, he gave a loud scolding note.

Both adults participated in incubation; on June 24, 1951, I flushed a male from Nest 4 (see below). He commenced singing after leaving the nest.

Song

The song of Bell's Vireo can hardly be considered a musical one, but it is distinctive and emphatic. Parts of it could be likened to that of the White-eyed Vireo (*Vireo griseus*), but the entire song is different. From a distance, the last and loudest portion of the song resembles that of the Alder Flycatcher (*Empidonax traillii*). This is only true when the rest of the song is inaudible. Males sing in the nest tree and this trait may possibly lead to destruction of the nest by the cowbird or other enemies. The typical song has been well-described by several authors, but Nolan has recorded in his notes a song that I have never heard. In speaking of this, he wrote, "They sang often, the regular gurgling song sometimes being replaced by a long, wild, squeaky performance which went on and on. It had no melody and was completely tuneless—it had the jerky, sputtering quality that characterizes part of the Ruby-crowned Kinglet's [*Regulus calendula*] song."

The existence of a territory is quickly perceived. As the observer approaches, the male begins to sing, often coming to meet the intruder. Males under observation sang at all hours of the day. One male at Lafayette sang once at 8:17 p.m. (Central Daylight Saving Time) on July 2, 1951, after I had "squeaked" a number of times to initiate singing. I found that squeaking often induced the male to sing, especially when the observer was near the nest site.

The song period in Indiana, from present records, ranged from April 24 (1948) to September 3 (1951). Singing rapidly diminished after August in Tippecanoe County, in 1951, however. On June 21, I timed a singing male for 15 minutes at Lafayette. This bird uttered his song from 9 to 17 times per minute; average, 13. During the last five minutes of this period, I was probably near the nest (though I did not locate it) and the bird increased his tempo so that he averaged 15 songs per minute. At 17 songs per minute, there is little pause between phrases and they pour out at a rapid rate. It is difficult to imagine how the bird could possibly sing more than 17 songs per minute. Apparently singing tempo decreases as the observer retires from the nest area, but quickly increases as he approaches.

Nesting Success

It is common knowledge that the Bell's Vireo is often parasitized by the cowbird. Cowbird interference was noted at seven of the 13 nests observed. In only one instance was a young cowbird raised. In most of the cases, the nest was deserted soon after cowbird eggs were laid.

Three young vireos disappeared from one nest when they were eight days old. This nest was not torn up or disturbed, possibly indicating that the predator was a snake. Keller observed a recently fledged vireo at Indianapolis, June 23, 1946, and I collected a fledgling at Lafayette on August 10, 1951. These are, to my knowledge, the only definite records of young birds being successfully produced in Indiana.

Data on six nests studied in 1950 and 1951 follow:

Nest 1 (1950)

May 23 — 4:30 p.m. Female on nest.
26 — 8:30 a.m. Female on nest. Nest held four vireo eggs.
June 2 — 7:45 a.m. Female on nest. Nest held three vireo eggs.
5 — Nest contained three vireo eggs.
7 — 9:45 a.m. Female on nest. Nest held one vireo egg and two very small young.
9 — Three young in nest.
15 — Nest empty but not torn up. Nest collected.

Nest 2 (1951)

May 13 — 8:15 a.m. Both adults building nest.
19 — 9:00 a.m. Nest contained a cowbird egg. Lining of nest not completed. Nest hanging loosely from fork.
21 — 9:30 a.m. Nest still contained cowbird egg. Took nest and discovered a second cowbird egg almost buried in the bottom of the nest.

Nest 3 (1951)

June 7 — New nest, in same tree as nest No. 2 above, completed except for lining.
8 — Nest empty.
9 — Nest empty.
12 — Female on nest; nest contained three vireo eggs.
14 — 4:40 p.m. An adult on nest. Nest held four vireo eggs.
15 — 6:25 p.m. Nest held one cowbird egg and no vireo eggs. No trace of vireo eggs on ground below nest.
17 — Cowbird eggs still in nest.
July 3 — Collected deserted nest.

Nest 4 (1951)

June 20 — 7:35 p.m. Male on nest. Nest held one vireo and one cowbird egg.
24 — Dr. I. W. Burr reported one vireo egg in nest.
July 2 — Nest empty. No vireos near site. Collected nest.

Nest 5 (1951)

May 28 — 3:20 p.m. Both adults building. Nest completed except for lining.
30 — Nest empty.
June 2 — Nest appeared completed but empty.
4 — 3:15 p.m. Female on nest. Nest contained one vireo and two cowbird eggs.

6 — 10:40 a.m. Nest held two vireo eggs and two cowbird eggs. I removed cowbird eggs.
7 — 4:10 p.m. Nest empty. One broken vireo egg on ground showed imprint of bird's beak.
8 — Nest empty. Male vireo singing nearby.
12 — Collected nest.

NEST 6 (1951)

July 3 — Nest located 50 yards from nest No. 5. A cowbird egg on ground below nest contained puncture as if made by beak of bird. Nest empty. No other data.

At nest No. 3, the cowbird apparently removed all four of the vireo eggs. Similar treatment was apparent at nest No. 5, from which two vireo eggs disappeared. On the other hand, at nests Nos. 4 and 6, I think it likely that the vireos removed the cowbird eggs.

SUMMARY

Bell's Vireo has been recorded in eight Indiana counties from 1943 to 1952. The first specimen was taken August 10, 1951, near Lafayette, Tippecanoe County, Indiana.

In Indiana, Bell's Vireo prefers areas where shrubby growths border, or are contained in, abandoned fields. Ground cover at the nest site is usually dense. Hawthorn is one of the favorite nest trees.

Nesting apparently begins in mid-May in Indiana. The nest is placed low in the tree, at an average height of about 31 inches.

Both adults participated in nest building and, apparently, incubation.

Singing was heard from April 24 to September 3. Nolan reported a variation of the song which is apparently little known. Males sometimes sang at the rate of 17 times per minute; average for 15 minutes of one which was timed, 13.

Cowbird interference resulted in a low nesting success.

ACKNOWLEDGMENTS

I wish to thank Dr. George M. Sutton for his comments and suggestions on the manuscript. I also wish to thank all of the persons who have graciously supplied me with their records and have given me permission to quote from their field notes.

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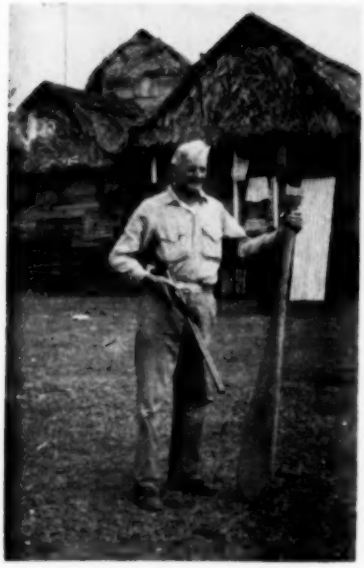
ROUTE 1, CORTLAND, INDIANA, JULY 3, 1952

NEW LIFE MEMBER



Alexander Wetmore, life member, has found birds his prime interest in life since his boyhood years in south-central Wisconsin. Educated at the University of Kansas and George Washington University, he was in the service of the old Biological Survey until 1924, and subsequently in the Smithsonian Institution. After 27 years as Assistant Secretary and Secretary of the Smithsonian, he is relinquishing heavy administrative duties at the end of 1952 to devote his entire time to research in ornithology. His principal contributions in several hundred papers have been in systematic classification, fossil birds, geographic distribution, and migration. His great pleasure is in active field work in tropical America. The photograph was taken in March, 1952, on the coast of western Panamá.

MORE BIRD WEIGHTS FROM SURINAM

BY FR. HAVERSCHMIDT

THE present list of bird weights from Surinam should be considered a continuation of my earlier list (1948. *Wilson Bulletin*, 60:230–239).

In the first list I gave weights of 216 species of birds; the present one contains the weights of a hundred additional species, many of them smaller birds which I was unable to weigh earlier. I also have included the weights of several species in the first list where more complete data were available now.

Nomenclature in the following list is based on Peters (1931–1951. "Check-list of birds of the world," Vols. 1–7, Cambridge, Mass.), Cory, Hellmayr, and Conover (1918–1949. *Field Mus. Nat. Hist. Zool. Ser.*, 13, Pts. 1–11), and Zimmer (1931–1951. "Studies of Peruvian birds, Nos. 1–61," *American Museum Novitates*). I should like to correct a mistake in my first list: *Melanerpes cruentatus* (*op. cit.*:235) should read *Melanerpes rubrifrons*.

			Grams
PELICANS. PELECANIDAE			
Pelecanus o. occidentalis	Dec.	? imm.	3000
HERONS. ARDEIDAE			
Pilherodius pileatus	Jan.	♂	518
SWANS, GEESE, AND DUCKS. ANATIDAE			
Nomonyx dominicus	Dec.	♀	298
CONDORS AND VULTURES. CATHARTIDAE			
Coragyps atratus	Mch.	?	1250
	May	♂	1500
Cathartes aura ruficollis	Apr.	?	1000
	Jly.	?	1250
Cathartes urubitinga	May	♀	1480
HAWKS. ACCIPITRIDAE			
Chondrohierax u. uncinatus	Jly.	♂	257
	Aug.	♀	247
Helicolestes hamatus	Aug.	♂	448
Buteo m. magnirostris	Sep.	2♀♀	310, 350
Buteo n. nitidus	Jly.	♂	492
	Nov.	♂	430
Busarellus n. nigricollis	Nov.	♀	758
Circus brasiliensis	May	♂	391
Geranospiza caerulescens	Nov.	♀	328
FALCONS, FALCONIDAE			
Daptrius ater	Apr.	♀	354
Milvago chimachima paludivagus	Jne.	♂, ♂ imm.	304, 329
		♀ imm.	351
Falco peregrinus anatum	Mch.	♀ imm.	934
PHEASANTS AND QUAIL. PHASIANIDAE			
Colinus cristatus sonnini	Feb.	♂	153
	Aug.	♀	131
Odontophorus g. gujanensis	Dec.	♀	298
RAILS. RALLIDAE			
Aramides c. cajanea	May	♂	408
Laterallus v. viridis	Jan.	♀	73

Plovers. Charadriidae			
Hoploxypterus cayanus	May	♀	84
Charadrius hiaticula semipalmatus	Oct.	♀	35
Charadrius collaris	Feb.	♀	29.1
	Aug.	♂	28.2
Sandpipers. Scolopacidae			
Tringa flavipes	Jne.	♂	88
Tringa melanoleuca	Feb.	2 ♀ ♀	140, 178
	Sept.	?	180
	Oct.	♂	155
	Dec.	♂	174
Capella p. paraguaiae	Jan.	♂	113
	Sep.	♀	103
	Nov.	2 ♀ ♀	109, 121
	Dec.	♂	109
Pigeons. Columbidae			
Columba c. cayennensis	Sept.	♂	251
Columba speciosa	Sept.	♂	285
Columba subvinacea purpureotincta	Nov.	♂	110
Columbigallina passerina griseola	Jan.	♀	33
Claravis pretiosa	Jly.	♂	66
Leptotila r. rufaxilla	Apr.	♀	137
	Jne.	♀	131
	Oct.	♀	135
Oreopeleia montana	May	♂ imm.	78
Parrots. Psittacidae			
Ara ararauna	Dec.	♂, ♀	1286, 1157
Ara manilata	Mch.	2 ♂ ♂	358, 360
Ara n. nobilis	Apr.	♀	144
Brotogeris c. chrysopterus	Jan.	♂, 2 ♀ ♀	69, 68, 68
Pionus fuscus	Jan.	♀	210
Amazona a. amazonica	Dec.	♂	403
Deroptyus a. accipitrinus	Sep.	♀	253
Cuckoos. Cuculidae			
Piaya c. cayana	Jan.	♀	103
Crotophaga major	Nov.	♂	171
Typical Owls. Strigidae			
Otus choliba crucigerus	Oct.	♂	138
Potoos. Nyctibiidae			
Nyctibius grandis	Jne.	♂	500
	Sep.	♂	604
Goatsuckers. Caprimulgidae			
Chordeiles a. acutipennis	Feb.	♂	42
	Nov.	3 ♂ ♂	48, 48, 50
		2 ♀ ♀	46, 46
	Dec.	♂	52
Caprimulgus c. cayennensis	Mch.	♂	38
	Jne.	♀	37
	Aug.	♂, 2 ♀ ♀	36, 35, 33
Caprimulgus n. nigrescens	Apr.	♀	39
Hydropsalis climacocerca schomburgki	Oct.	♂	34
Swifts. Apodidae			
Chaetura s. spinicauda	Sep.	♀	15
Chaetura b. brachyura	Apr.	♀	20.2
Reinarda s. squamata	Mch.	♀	10.5
	Jne.	2 ♂ ♂	9.4, 9.7
Hummingbirds. Trochilidae			
Glaucis h. hirsuta	Jan.	♂	5.0
	Mch.	♂	7.2

Phaethornis s. superciliosus	Mch.	♀	5.8
Phaethornis l. longuemareus	Jan.	♀	3.75
	Feb.	♀	2.92
	May	♀	3.16
	Jly.	♀	3.27
	Aug.	♂	3.75
	Sep.	♀	3.3
	Dec.	♂	2.9
Campylopterus l. largipennis	Mch.	♀	7.2
Florisuga m. mellivora	Apr.	2 ♂ ♂	6.97, 7.35
	Jly.	♀	6.9
Anthracothorax viridigula	Apr.	2 ♂ ♂	9.4, 9.8
	Nov.	2 ♂ ♂	10.4, 9.9
		♀	9.2
Anthracothorax n. nigricollis	Mch.	2 ♀ ♀	6.9, 7.4
	Apr.	3 ♂ ♂	7.2, 7.8, 8.2
	Aug.	♂, ♀	6.2, 6.3
Chrysolampis mosquitus	Mch.	♀	4.1
	Apr.	♂, ♀	4.4, 3.9
Chlorestes n. notatus	Apr.	♂	3.75
Hylocharis cyanus viridiventris	Apr.	♂	4.25
	May	2 ♂ ♂	3.48, 3.8
Smaragdites t. theresiae	Feb.	♂	3.6
	Jly.	♀	3.5
	Aug.	♂, ♀	3.58, 3.8
	Sep.	♂	3.9
	Nov.	♀	3.5
Amazilia f. fimbriata	Mch.	♂	4.5
	Apr.	♂, 2 ♀ ♀	4.8, 4.9, 5.8
	Nov.	♂	4.5
Amazilia l. leucogaster	Apr.	♂	4.9
	Nov.	♂, ♀	5.4, 4.7
	Dec.	♂, ♀	4.7, 4.6
TROGONS. TROGONIDAE			
Trogon s. strigilatus	Jan.	♀	84
	Oct.	♀	81
	Nov.	♂	98
Trogon v. violaceus	Sep.	♀	50
KINGFISHERS. ALCEDINIDAE			
Ceryle t. torquata	Jly.	♀	295
JACAMARS. GALBULIDAE			
Jacamerops a. aurea	Sept.	♀	58
PUFF-BIRDS. BUCCONIDAE			
Chelidoptera t. tenebrosa	Feb.	♀	39
BARBETS. CAPITONIDAE			
Capito n. niger	May	♀	54
TOUCANS. RAMPHASTIDAE			
Pteroglossus aracari roraimae	Jan.	♀	264
	Jly.	♂	237
	Sep.	♀	266
Pteroglossus v. viridis	Mch.	♂, 2 ♀ ♀	146, 136, 128
	Aug.	♂, ♀	136, 125
	Sep.	♂	143
Ramphastos v. vitellinus	Mch.	♂	358
	Jly.	♀	298
	Nov.	♂	423
	Dec.	♀	387
Ramphastos tucanus	Dec.	♀	514

Woodpeckers. Picidae			
Piculus f. flavigula	Jne.	♀	58
	Sep.	♀	44
Celeus elegans hellmayri	Apr.	♂	161
Celeus u. undatus	Jan.	♂, ♀	61, 64
Celeus f. flavus	Jly.	2 ♀ ♀	102, 108
Melanerpes c. cruentatus	Mch.	♂	60
Melanerpes rubrifrons	Dec.	♂, ♀	57, 60
Veniliornis cassini	Jan.	♀	32
Phloeoceastes m. melanoleucos	Jan.	2 ♂ ♂	269, 251
Phloeoceastes r. rubricollis	Jan.	♀	193
	May	♂	236
Wood-hewers. Dendrocolaptidae			
Dendrocincla f. fuliginosa	Jan.	♀	32
	Mch.	♀	37
Xiphorhynchus guttatus polystictus	Dec.	♂, ♀	61, 62
Lepidocolaptes a. albo-lineatus	Feb.	♂	19
	Sep.	♂	24
	Dec.	♀	20.3
Oven-birds. Furnariidae			
Synallaxis albescens josephinae	Mch.	♂, 2 ♀ ♀	14.7, 14.7, 14.6
	Apr.	♀	20
	Nov.	♂	16
	Dec.	♀	15
Philydor pyrrhodes	Jan.	♂	32.5
Automolus ochrolaemus turdinus	Apr.	♂, ♀	35, 36.1
	May	2 ♀ ♀	33, 33
Sclerurus rufigularis fulvigularis	Jan.	♀	23.1
Ant-birds. Formicariidae			
Frederickena viridis	Feb.	♂	71
Thamnophilus m. murinus	Jan.	♂	19
Pygiptila stellaris occipitalis	Feb.	♂	23.8
	Apr.	♂	25.8
	Jne.	♀	24.2
	Oct.	♂	25
Myrmotherula b. brachyura	Aug.	♀	7.8
Myrmotherula a. axillaris	May	2 ♂ ♂	9, 9.2
Herpsilochmus s. sticturus	Jan.	♂	11
Formicivora g. grisea	Feb.	♂	11.5
Myrmoborus leucophrys angustirostris	Dec.	2 ♂ ♂, ♀	21, 22, 21
Hypocnemis c. cantator	Jan.	♂, ♀	13, 14
	Feb.	♀	11.5
	Mch.	♂	12.3
	Apr.	♂	11.7
	Oct.	♂	12
	Dec.	♀	14
Hypocnemoides m. melanopogon	Dec.	2 ♂ ♂, ♀	14, 14, 16
Percnostola r. rufifrons	Sep.	♂	30
Myrmeciza f. ferruginea	Oct.	♂	25.9
Cotingas. Cotingidae			
Cotinga cayana	Jly.	♂	64
Xipholena punicea	May	♂, ♀ imm.	69, 60
Laniocera hypopyrrha	Mch.	♂	47.2
Lipaugus cineraceus	Apr.	♂	73
	Oct.	2 ♂ ♂	74, 73
Pachyramphus rufus	Mch.	♀	18.8
	Apr.	♀	18.6
	Jly.	♂	19.9

Pachyramphus polychopterus tristis	Apr.	♂	20.7
	May	♀	22.4
	Jne.	2 ♂♂, ♀	20.5, 20, 22.3
	Aug.	♂	24.5
	Sep.	♀	22.2
	Nov.	♂, ♀	23, 23
Pachyramphus marginatus nanus	Jan.	♂	18
Platypsaris minor	May	♂	38
	Sep.	♂, ♀	44, 39
Querula purpurata	Feb.	♂, ♀	104, 91
Gymnoderus foetidus	Sep.	♀	241
MANAKINS. PIPRIDAE			
Pipra a. aureola	May	2 ♂♂, ♂ imm.	14.9, 15.4, 16.3
	Dec.	♀	18
Pipra e. erythrocephala	Jan.	♂ imm.	11
	Feb.	♀	10.8
	Jne.	3 ♂♂	11.1, 11.2, 11.6
	Oct.	♂	10.2
	Dec.	♂	12
Pipra p. pipra	Dec.	2 ♂♂	9.1, 9.6
Manacus m. manacus	Mch.	♀	14.5
	Sep.	♂	17.7
	Dec.	♂	16.1
Schiffornis turdinus wallacii	Mch.	♀	31.3
	Feb.	3 ♂♂	30, 37, 31
	Apr.	♂	34
Neopelma chrysocephalum	Mch.	♂	15.7
	Nov.	♂	16
TYRANT FLYCATCHERS. TYRANNIDAE			
Fluvicola p. pica	Feb.	♂, ♀	15, 11.9
Tyrannus dominicensis vorax	Mch.	♀	55
Empidonomus varius rufinus	Feb.	2 ♂♂	23.9 26
	Mch.	2 ♂♂, ♀	24, 23, 24
	Nov.	♂	23
	Dec.	♀	25
Empidonomus varius varius	May	♀	27
	Jly.	♀	27
Myiodynastes maculatus solitarius	May	2 ♂♂	44, 47
Myiarchus f. ferox	Jan.	♀	29
	Feb.	♂	30.2
	Mch.	3 ♀♀	28.7, 29.2, 29.5
	Apr.	♂	30
	Jly.	♂	29
	Sep.	2 ♂♂, ♀	28.9, 29, 30
	Nov.	3 ♂♂	26, 28, 23
		♀	26
	Dec.	2 ♂♂	28, 26
		2 ♀♀	29, 30
Myiobius b. barbatus	Apr.	♂	10.4
Myiophobus f. fasciatus	Dec.	♂	11
Tolmomyias sulphurescens cherriei	Jly.	♂	13
	Nov.	♂	13
Tolmomyias poliocephalus sclateri	Jly.	♀	11.1
	Aug.	2 ♀♀	11, 11.3
	Nov.	♂, 2 ♀♀	12, 12, 12.1
Tolmomyias flaviventris collingwoodi	Mch.	♀	13.4
	May	♀	13.6
	Jly.	♂	13
	Aug.	♀	13.5

Rhynchocyclus olivaceus guianensis	Feb.	♀	20
Ramphotrigon ruficauda	Jan.	♀	16.2
	Jne.	2 ♂♂	15, 17.5
		♀	17.9
Todirostrum chrysocrotaphum pictum	Oct.	♂	6.53
Todirostrum c. cinereum	Feb.	♂	6.9
	Aug.	♀	6.6
Todirostrum m. maculatum	Jne.	♀	7.2
	Oct.	♂	7.6
Colopteryx galeatus	Mch.	♂	6.9
	Oct.	♂	7.4
Elaenia f. flavogaster	Nov.	♂	26
	Dec.	♂, ♀	25, 24
Elaenia cristata	Feb.	♀	19.3
	May	♀	17.4
	Nov.	♀	18
Elaenia gaimardii guianensis	Apr.	♀	11.1
	Sep.	♂	12.8
Elaenia flavivertex	Dec.	♀	11
Phaeomyias murina incomta	Feb.	♂	10.3
Camptostoma obsoletum napaeum	Feb.	♂	9.5
	Mch.	♀	7.7
	Jne.	♂	8.0
	Jly.	♂	9.4
	Sep.	♀	7.75
Tyrannulus e. elatus	Jan.	♂	8
	Aug.	♀	7.3
Pipromorpha o. oleaginea	Oct.	♀	10.4
Pipromorpha m. macconnelli	Oct.	♂	14.5
SWALLOWS. HIRUNDINIDAE			
Progne s. subis	Oct.	♀	52
Progne c. chalybea	Jan.	♀	40
	Jne.	♀	37
	Aug.	2 ♂♂	45, 50
	Dec.	♂	39
Phaeoprogne t. tapera	Jan.	♂	34
	Nov.	♀	36
	Dec.	3 ♀♀	32, 34, 45
		♂	30
WRENS. TROGLODYTIDAE			
Thryothorus leucotis albipectus	Dec.	2 ♀♀	23, 25
Thryothorus c. coraya	Mch.	♂, ♀	15.4, 17.3
	Nov.	♀	15
Troglodytes musculus clarus	Apr.	♂, ♀	12.2, 13.4
	May	♀	11.7
	Jne.	♂	12.6
Henicorhina l. leucosticta	Apr.	♂	15.5
MOCKINGBIRDS. MIMIDAE			
Mimus g. gilvus	Jan.	♂ imm.	52
THRUSHES. TURDIDAE			
Turdus n. nudigenis	Jne.	♀	69
Turdus leucomelas ephippialis	Jne.	♀	75
WARBLERS, GNATCATCHERS, AND KINGLETS. SYLVIIDAE			
Polioptila p. plumbea	Jly.	♂	6.9
	Oct.	♂, ♀	7, 7
Ramphocaenus melanurus albiventris	Apr.	2 ♂♂, ♀	8.2, 8.7, 8.3
VIREOS. VIREONIDAE			
Hylophilus pectoralis	Feb.	♂, ♀	11.7, 11.8
	Mch.	♀	11.7

Honey-creepers. Coerebidae			
Cyanerpes c. cyaneus	Feb.	♂	12.7
	Mch.	♀	13.1
	Apr.	♂	14
	May	♀	12.2
	Nov.	♂	12.2
Cyanerpes c. caeruleus	May	♀, ♂	9.6, 10.8
Coereba flaveola minima	Mch.	♀	9.5
	May	♂	8.2
	Aug.	♂	9.9
Wood Warblers, Parulidae			
Dendroica petechia aestiva	Mch.	3 ♀ ♀	8.6, 10.5, 13.2
	Sep.	♀	11
Troupials. Icteridae			
Xanthornus d. decumanus	Feb.	♀	157
	Aug.	♂, ♀	291, 148
	Sep.	♀	151
Cacicus c. cela	Mch.	♂	103
		4 ♀ ♀	59, 62, 63, 68
Molothrus bonariensis minimus	Jly.	♀	36
Icterus chrysocephalus	Jne.	♂	42
	Dec.	♂	44
Icterus n. nigrogularis	Apr.	♂, ♂ imm.	40, 36
Leistes m. militaris	Jan.	♂	48
	May	2 ♂ ♂	47, 48
	Dec.	♂ imm.	41
Sturnella magna subsp.	Jan.	♂ imm., 2 ♀ ♀	79, 77, 74
	Feb.	♂	95
	Mch.	♂, ♀	86, 72
	Apr.	♂, ♂ imm.	86, 72
	Oct.	♂	91
	Nov.	♂	91
		3 ♀ ♀	81, 73, 64
	Dec.	♂, 3 ♀ ♀	92, 80, 73, 72
Tanagers. Thraupidae			
Tanagra v. violacea	Aug.	♂, ♀	13.8, 12.7
	Oct.	♀	14.7
	Dec.	♂	13.0
Tangara c. cayana	Feb.	♂, ♀	20.3, 19
	Apr.	♂, ♀	19, 17
	May	♂	17
	Dec.	♂	19
Thraupis e. episcopus	Feb.	♂	28
	Jne.	♂	37
Ramphocelus c. carbo	Sep.	3 ♂ ♂	25.5, 26, 29
	Nov.	♂ imm.	27.5
Tachyphonus cristatus intercedens	Feb.	♂	19.5
Tachyphonus phoenicius	Jan.	♀	25
	Mch.	♂ imm.	21.2
	Apr.	♂ imm.	22
	Nov.	♂, ♂ imm.	22, 20
Eucometis p. penicillata	Dec.	♀	29
Nemosia pileata surinamensis	Apr.	♂, 2 ♀ ♀	16.3, 17, 17.5
	Jne.	♂	14.5
	Jly.	♂, ♀ imm.	16, 20.7
Hemithraupis guira nigrigula	Mch.	♂	11.4
	Sep.	♂	11.2
Schistochlamys m. melanopis	Jan.	♂	30
	May	♀	29
	Nov.	♂	33

FINCHES. FRINGILLIDAE			
Saltator coerulescens olivascens	Jly.	♂	54
Caryothraustes c. canadensis	Jan.	♂, 2 ♀ ♀	34, 36, 36
Sporophila plumbea whiteleyana	Mch.	♂	9.7
Sporophila m. minuta	Feb.	♂	7.3
	May	♂	7.4
	Aug.	♀	7.9
	Nov.	♂	8.3
	Dec.	♂	9
Sporophila castaneiventris	Jan.	♂	6.8
Oryzoborus angolensis torridus	Mch.	3 ♂ ♂	11.4, 12.7, 13.1
	Dec.	♂	12
Volatinia jacarina splendens	Mch.	♂	9.6
Myospiza h. humeralis	Dec.	♀	18

P. O. Box 644, Paramaribo, Surinam, Dutch Guiana, December 28, 1951

THE WILSON ORNITHOLOGICAL CLUB LIBRARY

The following gifts have been recently received. From:

Irwin M. Alperin—2 magazines
William J. Beecher—3 reprints
A. J. Berger—2 reprints
Hervey Brackbill—1 reprint
Lawrence B. Chapman—1 book
David E. Davis—66 magazines
Carl Edelstam—1 reprint
Fred H. Glenny—1 reprint
William C. Grimm—1 book
Fr. Haverschmidt—1 reprint
Harold M. Holland—2 reprints
Philip S. Humphrey—1 reprint
Leon Kelso—2 pamphlets, 78 magazines
S. Charles Kendeigh—1 book
Robert M. Laughlin—1 reprint
Margaret M. Nice—15 reprints, 10 magazines, 2 books
Kenneth C. Parkes—4 reprints
Robert W. Storer—2 books
H. B. Tordoff—1 book
Wisconsin Conservation Department—1 pamphlet

GENERAL NOTES

Mortality of migrating birds at Mt. Washington, New Hampshire.—The following observation was reported to me by Herbert Drury of Norwich, Vermont, who was a Dartmouth College student at the time.

On April 15, 1951, Mr. Drury, in company with Mr. Brad Richardson and several other students, were skiing in Tuckerman's Ravine on Mt. Washington, New Hampshire. Mr. Drury wrote: "It was cold, snowing and blowing so hard that . . . visibility was reduced to less than 50 feet. At six that morning it had been clear with no wind. At the base of the Headwall and at least a third of the way up to the lip of the Headwall, we found several dead birds frozen in the loose snow that was blowing down into the Ravine toward Pinkham Notch. The birds were somewhat battered up. Those that I identified included: 4 Golden-Crowned Kinglets [*Regulus satrapa*]; 4 Winter Wrens [*Troglodytes troglodytes*]; one Yellow-bellied Sapsucker [*Sphyrapicus varius*]; one Robin [*Turdus migratorius*]; one female Purple Finch [*Carpodacus purpureus*]. Undoubtedly there were more birds buried under the snow; and other birds were picked up by other skiiers and carried down the mountain. The downdraft winds attained velocities of 40 to 50 m.p.h. that day. We suspect that migrating flocks coming over the mountain from the opposite [west] side were caught in these downdrafts and buffeted by the swirling snow until they perished."—Douglas E. Wade, *Dept. of Entomology and Zoology, Clemson Agricultural College, Clemson, South Carolina, March 28, 1952.*

Turkey Vultures attacking Great Blue Heron.—In the vicinity of Pymatuning Lake, Ashtabula County, Ohio, there is a large Great Blue Heron (*Ardea herodias*) nesting colony and a Turkey Vulture (*Cathartes aura*) roost. This colony and this roost are in a sugar maple (*Acer saccharum*)-beech (*Fagus grandifolia*) climax forest. Most of the heron nests are in beech trees, a few trees having as many as twelve nests.

Approximately 100 vultures took flight when J. B. Ross, of Decatur, Georgia, and I entered the forest on the evening of August 14, 1949. Shortly after this flight a disturbance was detected at the top of a beech. There four Turkey Vultures were attacking one adult Great Blue Heron in a nest. The vultures flew at the heron from all sides. The heron made rapid thrusts at its attackers, and after five minutes of battle, the vultures left the heron. This Great Blue Heron was the only one observed in the rookery, all of the other herons having left about the first of August. The question arises as to why this adult bird was attached to a nest late in the summer. The nest was high in a beech, and it was not investigated.

Heron colonies in the Pymatuning area have been deserted without any apparent reason. One colony was abandoned after the eggs had been laid, another after the young had hatched (Todd, 1940. "Birds of Western Pennsylvania," pp. 48–52). Perhaps activities of the Turkey Vulture could be a factor in the moving of heron colonies.—John F. Mehner, *Pymatuning Laboratory, Department of Biological Sciences, University of Pittsburgh, Pittsburgh, Pennsylvania, September 1, 1951.*

Light intensity and waterfowl flight; pre-flight activities.—In spring and fall, scatterings of waterfowl often appear on the reservoirs in Baltimore, Maryland. The birds stay from a few hours to several days. When they depart, it is occasionally at a daytime hour, but usually in late evening. Rarely, after an evening departure, a similar flock is present again the next day, as if the same individuals had returned from a

night rafting place. Generally, however, the waterfowl leave for good on their first evening, so that it appears they have resumed migratory flights. During several years that I lived near one reservoir, I obtained some observations which suggest a correlation between departure times and light intensities. Although my data are too few to be conclusive, I offer them now because I have no prospect of obtaining more.

Within any species, departures on cloudy evenings were practically always earlier than those on clear ones. Two species appeared often enough in unmixed flocks to provide several observations in similar weather; each showed a fairly uniform departure time, in relation to sunset, under given conditions. One species was noteworthy for generally leaving before, instead of after, sunset; wider observations might disclose some specific differences in this respect. There was no correlation observed between departure times and temperature, wind direction, or wind force.

Either bathing or diving was an almost invariable preliminary to flight on the part of every species observed. Some of the birds also did wing-flapping, made little rushes on the water, or swam to and fro in a "nervous" manner shortly before taking off. Some species indulged in several or all of these activities on different evenings, or even on the same evening. The activities were usually performed intermittently, and the amount of time devoted to them before the take-off varied as much as from 1 to 30 minutes for single species.

On occasions when all the birds involved were of one species, departures were made as follows:

	No. of Birds	Date	Sunset	Departure Hour	Departure Min. after Sunset	Sky
Pied-billed Grebe	2	Sep. 27 '41	5:57	6:30	33	Clear
(*Podilymbus podiceps*)	1	Sep. 29 '41	5:54	6:28	34	Clear
	2	Sep. 23 '42	6:05	6:41	36	Clear
Scaup	18	Apr. 12 '42	6:40	7:10	30	Clear
(*Aythya* sp.)	17	Apr. 13 '42	6:40	7:16	36	Clear
	6	Apr. 16 '42	6:44	7:17	33	Clear
	1	Sep. 30 '41	5:52	6:32	40	Light clouds
	6	Apr. 3 '42	6:31	7:00	29	Cloudy
	6	Oct. 25 '42	5:14	5:35	21	Cloudy
Bufflehead	3	Dec. 17 '39	4:44	5:23	39	Clear
(*Bucephala albeola*)	1	Nov. 9 '41	4:56	5:31	35	Partly cloudy
Old-squaw	1	Nov. 3 '39	5:05	4:56	– 9*	Clear
(*Clangula hyemalis*)	2	Nov. 6 '41	4:59	4:41	–18*	Cloudy
	1	Dec. 30 '38	4:51	still present at 4:54		Clear
Ruddy Duck	3	Nov. 13 '41	4:52	5:31	39	Clear
(*Oxyura jamaicensis*)						
Coot	1	Oct. 7 '42	5:41	6:22	41	Clear
(*Fulica americana*)						

*Before sunset.

When mixed bunches of birds were on the reservoir, the various species sometimes left separately and sometimes together; a given species might act differently on different occasions. Observations were:

	No. of Birds	Date	Sunset	Departure Hour	Departure Min. after Sunset	Sky
Ruddy Duck	6	Nov. 8 '39	4:59	5:30	31	Cloudy
Scaup	1			5:30	31	
Pied-billed Grebe	1	Oct. 11 '41	5:35	6:03	28	Clear
Coot	1			6:10	35	
Unidentified duck	1			6:15	40	
Bufflehead	1	Oct. 28 '41	5:11	5:41	30	Clear
Pied-billed Grebe	2			5:51	40	
Bufflehead	2	Nov. 12 '41	4:53	5:22	29	Clear
Ruddy Duck	1			5:23	30	
Ring-necked Duck (*Aythya collaris*)	1			5:23	30	
Scaup	1			5:23	30	
Scaup	9	Apr. 14 '42	6:42	7:17	35	Clear
Pied-billed Grebe	1			7:17	35	

Examples of the pre-flight activities are:

Pied-billed Grebe. September 23, 1942, two birds: Between 5:35 and 6:25 p.m. the only activities were some food dives (up to 12 seconds in length) by one bird at 5:48, and four minutes of bathing, preening and wing-flapping by both from 6:01 to 6:05. From 6:25 to the take-off at 6:41 frequent dives perhaps three seconds in length were made, and one bird once flapped its wings and preened a bit.

Scaup. April 3, 1942, six: From 6:08 to 6:40 p.m. the birds steadily dived for food, then they idled. At 6:57 several flapped their wings. At 7:00 all flew.

April 12, 1942, eighteen: From 6:49 to 7:03 p.m. the birds dived for food, then idled. At 7:08 several flapped their wings. At 7:10 all left.

October 25, 1942, six: From 4:49 to 5:15 they slept. On waking, they swam down the reservoir. At 5:21 one flapped its wings. From 5:30 to the 5:35 take-off all repeatedly ducked completely under water, between-times swam to and fro in a nervous way, and twice one or a few did some wing-flapping.

Bufflehead. December 17, 1939, three: From 4:35 to 5:02 p.m. all slept. On waking, they swam a little; one flapped its wings. Five times between 5:07 and 5:22, at intervals of one to six minutes, all bathed. At 5:22 all made one sudden dive of about five seconds, on arising bathed once more, then left at 5:23.

Coot. October 7, 1942, one: From 6:08 to 6:18 p.m. it idled. At 6:18 it ducked completely under water, then ducked its head and neck. At 6:22 it left.—Hervey Brackbill, *4608 Springdale Avenue, Baltimore 7, Maryland, March 1, 1952.*

EDITORIAL

The editors are grateful to the following persons for editorial assistance in preparing the current volume of *The Wilson Bulletin* for publication: Aaron M. Bagg, Andrew J. Berger, Eugene Eisenmann, James S. Findley, Richard and Jean Graber, W. W. H. Gunn, Robert M. Mengel, A. D. Moore, Margaret M. Nice, Kenneth C. Parkes, Robert W. Storer, George M. Sutton, J. Van Tyne, John A. White, Robert W. Wilson, Albert Wolfson.

The Membership Committee

Everyone who has an interest in birds should, we think, belong to The Wilson Ornithological Club. Every member knows someone who would profit by fellowship with us. The club would profit by having stronger support, greater influence, and an additional reservoir of material for the *Bulletin*.

The nomination form accompanying dues notices is one way the membership committee hopes to obtain the names of these interested people. We as a committee know but a fraction of them. Your committee would like to report next June that the club has a membership of two thousand. With your help it can be done. Send the nomination forms to the Treasurer along with your dues, or to any of the membership committee listed below:

Ralph M. Edeburn, Chairman, Marshall College, Huntington, W. Va.
Thomas D. Burleigh, Forestry Building, Univ. of Idaho, Moscow.
Ben B. Coffey, Jr., 672 N. Belvedere, Memphis 7, Tenn.
Robert C. Conn, 769 Park Avenue, Bound Brook, N. J.
Virginia S. Eifert, 705 West Vine Street, Springfield, Ill.
Eugene Eisenmann, 11 Broadway, New York 4, N. Y.
Alfred E. Eynon, 5 Beach Road, Verona, N. J.
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Mary B. Kimball, Sisterville, W. Va.
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Wendell P. Smith, Newbury, Vt.
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George M. Sutton, Department of Zoology, Univ. of Oklahoma, Norman.
Lewis M. Terrill, 216 Redfern Avenue, Westmount, Montreal 6, Quebec, Canada.

ORNITHOLOGICAL LITERATURE

FLEAS, FLUKES AND CUCKOOS . . . A STUDY OF BIRD PARASITES. By Miriam Rothschild and Theresa Clay. (The New Naturalist series.) Collins, London, 1952, 5¾×8½ in., xiv + 304 pp., 40 pls., 5 numbered and many unnumbered text figs. 21 s. ($2.94).

Behind a rather enigmatic title we find here a work which not only answers an urgent need for the average ornithologist, but does so in a most entertaining fashion. The field of bird parasitology has but a handful of specialists; yet it is one to which many are in a position to contribute, if only their interest is aroused by more readily obtainable basic information. Though the authors may have tried to crowd too much within the space of one small volume, they have done an admirable job, supporting their fresh popular account with plenty of sound scientific fact, and abundant suggestion for work to be done. Who would not be impressed by the mite adapted for life in the white areas of a nightjar's wings, or by the quill-louse known only from the remiges of a curlew! But this is no rambling series of parasitological oddities. The bird, with its parasites, is pictured as a little world, presenting all the problems of adaptation, competition, and evolutionary convergence and divergence found elsewhere.

The first part has brief and stimulating discussions of some of the problems of parasitism in general. Then follows what is to me the best section, closely comparing the bird-lice (Mallophaga) with the bird-fleas, groups upon which the junior and senior authors are respectively authorities. The Mallophaga are seen as an ancient, closely adapted, and much diversified group; the fleas (so far as birds are concerned) as a recent one, small in number of species and still imperfectly adjusted. In looking at the problems of the two groups side by side, we gain a much greater feeling of familiarity with both. The remainder of the book is a condensed survey of all the other major groups of bird parasites, including birds themselves, with consideration of typical life-histories and of the complex faunas of bird nests. Only in a few small groups could any attempt be made even to list the British species; but some sort of skeleton classification is usually presented, and the reader would find some help in starting identification.

Ornithologists will view with mingled feelings the recurring comments on parasites as indicators of avian relationships. There is in most cases remarkable confirmation of accepted systems. But attention is called, for example, to suggestions that the ostriches and rheas must after all be closely related, and that the flamingos do in fact belong with the anseriforms; and to such absurdities as linking (if we consider Mallophaga alone) the hawks, owls, and cuckoos. The authors take a fair-minded stand on the whole matter, urging the ornithologist to "accept the evidence from this source at least as a clue to relationship," while themselves pointing out some pitfalls threatening the parasitologist.

There are some typographical errors, one or two of which involve references to plates or pages and prove a trifle annoying. The excellent plates, many of them photomicrographs, will prove helpful in many ways. The indexing seems adequate, though in some ways unnecessarily complicated. Readers inspired to extend their studies of any group will find the fourteen-page bibliographical appendix extremely useful. It gives every evidence of being critically and expertly selected.

Books thus aimed at bringing together different fields of specialization are all too few. Though dealing specifically with the British fauna, this work outlines broader principles that are just as applicable elsewhere. I hope it is made readily available in

this country, to find its way to the shelf of every bird student interested in broadening his point of view.—William A. Lunk.

BIRDS AS INDIVIDUALS, By Len Howard. Collins, London. 1952:223 pp., 32 plates. 10s. 6d. ($1.47).

Miss Howard is an English musician and amateur ornithologist who has succeeded, through extraordinary patience and tolerance, in overcoming completely the normal fear of humans in the small passerine birds around her Sussex cottage. Not only do birds come fearlessly to her hand while out-of-doors, but they also have complete freedom of the house; some even roost in the bedroom with the author. She wisely lists the disadvantages as well as the pleasures of such a living arrangement at the start of the book. Probably no other writer has ever been so closely acquainted with so many unconfined wild birds, and Miss Howard's observations and conclusions will be of interest to all students of avian behavior.

The book is divided into two sections. The first section, of 150 pages, is entitled "Bird Behavior." In this portion the author narrates her experiences with birds of her neighborhood, particularly Great Tits (*Parus major*) and Blackbirds (*Turdus merula*). This makes pleasant reading and includes many interesting and important notes on the great differences in behavior shown by individuals within a species. One such note tells of a Great Tit which, after being seriously injured and defeated in combat with another male, recovered his territory from the erstwhile victor by improvising highly elaborate bluff and threat displays. Another is the account of a Blackbird which always used an oak leaf held in his beak as an aid in courtship and territorial activity. Observations of this sort illustrate well the intraspecific plasticity which may lead to the evolution of new and striking behavior patterns.

The first section is concluded with a chapter entitled "The Mind of a Bird" which is probably the most controversial part of the book. In this chapter the author criticizes modern behavior theory for not attributing a greater and more human degree of intelligence and emotion to birds. Miss Howard makes a good case for the intelligence of some of the birds with which she is intimately acquainted, but whether or not some of the activities she describes should be attributed to reasoning or human-like emotions is largely a matter of opinion. No ornithologist would deny that birds often seem closely attached to their mates or young ("love"), or are aggressive toward rivals ("jealousy"), etc., but it is certainly debatable that birds feel such emotions in a way similar to humans. The reader may decide for himself whether Miss Howard is correct in taking the affirmative. Beyond this, probably few biologists will agree with her proposal that birds have some system of thought transference or mental telepathy, despite the claims of parapsychologists.

The second and shorter section of the book is an analysis of technique in bird song, written primarily from the standpoint of a musician. Miss Howard's perceptive discussion will be enjoyed by American readers even though they may be unfamiliar with the songs of the species described, and the author's deep appreciation and feeling for music has moved her to some charming descriptive passages. Miss Howard is consciously anthropomorphic in some of her interpretations, but, as before, she offers reasons for her opinions.

The book is written in a clear and simple manner, but the style is marred by the

rather frequent use of comma splices and other unfortunate constructions which more rigorous editing could have eliminated. Only vernacular names of birds are used, and these are of the British *Handbook*. Julian Huxley has contributed a brief foreword, and Eric Hosking has supplied excellent high-speed photographs illustrating most of the species discussed.—Thomas R. Howell.

THE GREENSHANK. By Desmond Nethersole-Thompson. Collins, St. James's Place, London, 1951:5¼×7^{13}⁄$_{16}$ in., 244 pp., with four color photographs, 42 black-and-white photographs, and 12 maps and diagrams. 15s ($2.10).

"The Greenshank" is the twenty-second volume to be published in The New Naturalist series. As stated by the publisher the aim of this series "is to interest the general reader in the wild life of Britain by recapturing the inquiring spirit of the old naturalists. The Editors believe that the natural pride of the British public in their native fauna and flora, to which must be added concern for their conservation, is best fostered by maintaining a high standard of accuracy combined with clarity of exposition in presenting the results of modern scientific research." The success of the earlier volumes is evidence of the wisdom of this editorial policy. The Collins Press is to be commended on its awareness of the importance of having a conservation-minded public.

Mr. and Mrs. Nethersole-Thompson spent 15 years gathering the data for this life-history of the Greenshank (*Tringa nebularia*). The various aspects of breeding biology were studied thoroughly. An excellent compilation of the meager information previously published on the Greenshank makes interesting reading and serves, also, to emphasize the contribution made by the present study.

The distribution of the Greenshank in Britain and abroad, migration, habitat, population density, enemies, and food are treated in early chapters. Later chapters discuss voice, courtship, egg-laying, clutch-size, incubation, hatching, and behavior of the young. Especially interesting and pertinent are the discussions of comparative data on other species. Some of the subjects discussed are: choice of nest-site (pp. 143–146), egg-laying (pp. 151–153), "The probable existence of local strains, as evidenced by egg-types peculiar to a particular district" (pp. 158–159), behavior changes of adults when young are hatching (pp. 175–178), development of the "fear reaction" (p. 193), and "Psychology and Emotion" (Chapter 19).

In the chapter on "Nest-Hunting" the author explains why so few nests of the Greenshank had been found previously and describes the technique which enabled the Nethersole-Thompsons to find "over 150" nests. One finds little in literature which deals with the technique of finding birds' nests, although this is an important aspect of life-history study.

A chapter on "Triangles" describes, among others, the relationship of a male Greenshank mated to two females and the actual laying of these two females in the same nest. The author reports that "Over sixty normally monogamous birds, to my knowledge, have been proved or suspected as bigamists or polygamists . . . ." There follows a stimulating discussion of several notable examples from literature.

The book concludes with six appendices, a bibliography, and an index. The appendices present information on the following subjects: forests "in which Greenshanks have been found during the Breeding-Season," vernacular names, "A Musical Appreciation of the Calls of the Greenshank" by M. E. W. North, egg-laying data, "Brooding Diaries,"

egg-shell disposal and hatching behavior. The admirable photographs increase one's understanding of the Greenshank and its breeding habitat.

One hesitates to criticise adversely the excellent work of the Nethersole-Thompsons, yet I cannot refrain from expressing regret that these keen field observers did not attempt to color-mark their birds. Plate 2, "Eggs laid 1921–33 by same hen Greenshank (*Elizabeth*)," would be much more convincing if "Elizabeth" had been banded. The author identified the female Greenshanks "by their eggs and behaviour." It must be admitted that people working with certain falconiform birds feel strongly, perhaps rightly so, that it is possible to identify a given female by egg color-pattern. Furthermore, anyone working intensively with passerine birds frequently has the feeling that he can identify a given bird by pecularities of song or behavior. Nevertheless, such feeling is not proof and such an approach cannot be considered adequate in modern ornithological studies. Mr. Nethersole-Thompson himself is fully cognizant of this fact, for he stated (p. 66): "If I had my time over again I should certainly try to devise a method of capturing and marking them [i.e., hen Greenshanks] with coloured rings . . . ."

There is a great need for research on the genetics of egg color-pattern in wild birds. It has not yet been proven conclusively that egg color-pattern is a reliable criterion for identifying a given female during a particular breeding season or over a period of years. Nor do we know, with very few exceptions, what influence the male has on the egg color-pattern of his female descendants. Punnett (1933. *Jour. Genetics*, 27:466–467) has shown that in the domestic chicken the male and female are of equal importance in transmitting one hereditary factor which determines one particular egg color. Chance (1940. "The truth about the Cuckoo," p. 194) assumed the same to be true of the European Cuckoo (*Cuculus canorus*), but Baker (1942. "Cuckoo Problems," pp.107–109) thought it highly unlikely that the male has any effect on the egg pattern, and (p. 179) stated: "The coloration and character of eggs are inherited from mother to daughter. The male Cuckoo cannot influence the character or colour of egg laid by its mate, nor of those laid by its progeny." For a summary of current knowledge on related problems see Chapter 11 of F. B. Hutt's recent (1949) book "Genetics of the Fowl."

The author closes his book with the following statement: "We watch birds, try to interpret their actions and behaviour, but shall we ever succeed in understanding them? I dedicate my book to those who will follow me and who will walk more steadily where I have only stumbled." How far more advanced would be our knowledge of the life-histories of birds had more us "stumbled" as intelligently as the Nethersole-Thompsons! —Andrew J. Berger.

BREEDING BIRDS OF KASHMIR. By R. S. P. Bates and E. H. N. Lowther. Oxford University Press, London, 1952:6×8¾ in., xxxiii + 365 pp., with 5 color plates, 151 photographs, and end-paper maps. ($7.50).

It is always very satisfactory to find a book written by the greatest authorities on the subject, and such is this one. No more competent observers of the avian life of Kashmir exist than Colonel Bates and Mr. Lowther. Their photographs and shorter articles have graced the pages of the *Journal of the Bombay Natural History Society* for many years, and will, I hope, for many more to come. Their observations in Kashmir date back to 1920, a considerable span of time, but a necessary one when the large

avifauna is considered together with the paucity of previous notes or observations in so many cases.

The book considers 221 species with an additional provisional list of over 40. Many of these species have been photographed at the nest by one or other of the authors for the first time. Each species is carefully described for field identification, with references to its more detailed description in standard works. The Kashmiri name is given in addition to the English name, and a Latin name which will at least identify the bird even if it is not always entirely up-to-date. There are good notes on distribution, and—here is the meat of the book—excellent notes on habits and nesting. These last, to any ornithologist or student of Asian birds, are priceless. They are accurate, painstaking, and informative. They are models of their kind. Finally there is a detailed description of the nest and eggs.

Six illustrative colored plates of Kashmir birds by Mrs. D. V. Cowen, and clear and comprehensive end-paper maps complete the volume. This book is a mine of information for amateur and professional bird watchers or ornithologists and should be a standard reference work for any such person going to India or its neighborhood. I hope that it will achieve the greatest possible popularity.—S. Dillon Ripley.

WILSON ORNITHOLOGICAL CLUB NOTES

1953 Annual Meeting

At the invitation of the University of Michigan and the Michigan Audubon Society, the thirty-fourth Annual Meeting of the Wilson Ornithological Club will be held at the University of Michigan Biological Station, at Douglas Lake, near Cheboygan, Michigan, from Sunday, June 14, to Wednesday, June 17, 1953.

Official notification of the meeting, details of arrangements, and request for papers will be mailed to the membership in the spring, but members are urged to plan now to attend what promises to be a most interesting meeting in this northern scenic area.

Committee Appointments

The President has made the following appointments, to serve for the 1952-1953 year: *Conservation Committee*, Robert A. McCabe, Chairman; *Illustrations Committee*, Robert M. Mengel, Chairman; *Investing Trustees*, A. W. Schorger, Chairman (term expires 1953), Aaron Moore Bagg (term expires 1954), Burt L. Monroe (term expires 1955); *Library Committee*, George J. Wallace, Chairman; *Local Committee on Arrangement for the 1953 Meeting*, Olin Sewall Pettingill, Jr., Chairman, Nicholas L. Cuthbert, Vice-Chairman; *Membership Committee*, Ralph M. Edeburn, Chairman; *Research Grant Committee*, John T. Emlen, Jr., Chairman; *Representative on the American Ornithologists' Union Council*, Burt L. Monroe.

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Coombes, Robert Armitage Hamilton, The Zoological Museum, Tring, Hertfordshire, England 1936
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Davant, Miss Mary, 861 No. McLean Blvd., Memphis 7, Tennessee 1952
Davey, Stuart Price, 119 No. Forest Ave., Ann Arbor, Michigan 1951
Davey, Dr. Winthrop N[ewbury], University Hospital, Ann Arbor, Michigan 1941
Davidson, Miss Sarah A., 344 Summit Ave., St. Paul 2, Minnesota 1949
Davidson, William Mark, 1504 Bodell St., Orlando, Florida 1933
Davis, Clifford Vernon, Dept. of Zoology & Entomology, Montana State College, Bozeman, Montana 1945
Davis, David E[dward], School of Hygiene & Public Health, Johns Hopkins University, Baltimore 5, Maryland 1940
*Davis, Earle A., Jr., Dept. of Zoology, Univ. of Illinois, Champaign, Illinois 1951
Davis, Howard Henry, Esq., Little Stoke, Patchway, Bristol, England 1947
Davis, John, Moore Laboratory, Box 388, Occidental College of Los Angeles, Los Angeles 41, California 1939
Davis, L[ouie] Irby, Box 988, Harlingen, Texas 1933
Davis, Russell S., Clayton, Illinois 1947
Davis, W[illiam] B., Dept. of Wildlife Management, College Station, Texas 1938
Davis, William Franklin, 423 W. 46th St., Ashtabula, Ohio 1947
Davisson, A. Paul, 1112 Fleming Ave., Edgemont, Fairmont, West Virginia 1947
Dawn, Walter H[enry], 53-55 64th, Ridgewood Plateau, Maspeth 78, Long Island, New York 1945

Dawson, Richard G[len], 6114 Indiana Ave., Kansas City 4, Missouri 1949
Dean, Mrs. Blanche Evans, 1503 Ridge Rd., Homewood, Birmingham 9, Alabama 1947
Dean, Sue McEldowney (Mrs. Frederick C.), 14 Middle St., Orono, Maine 1949
Dear, Lieut. Col. L[ionel] S[extus], P.O. Box 127, Port Arthur, Ontario, Canada 1939
Dechen, Mrs. Lillian Orvetta, 14 Summer St., Port Dickinson, Binghamton 6, New York 1939
Decker, C[harles] O., 6450 Kenwood Ave., Chicago 37, Illinois 1938
Decker, James H., 1543 32nd St., Des Moines 11, Iowa 1951
Deevey, Edward S[mith], Jr., Osborn Zoological Laboratory, Yale Univ., New Haven 11, Connecticut 1948
DeGarmo, William Russell, Beverly, West Virginia 1946
Degroot, Dudley Sargent, 2808 General Chennault, Albuquerque, New Mexico 1948
Dehner, Rev. Eugene W[illiam], St. Benedict's College, Atchison, Kansas 1944
**Delacour, Jean Theodore, c/o Los Angeles County Museum, Exposition Park, Los Angeles 7, California 1944
Delavan, Wayne G., Route 2, Box 61, Bronson, Kansas 1943
*DeLury, Ralph Emerson, 330 Fairmont Ave., Ottawa, Ontario, Canada 1920
Delzell, David E., Dept. of Zoology, McMaster Univ., Hamilton, Ontario, Canada 1951
Denham, Reginald [Francis], 100 Central Park, South, New York 19, New York 1948
Denton, J[ames] Fred, 1510 Pendleton Road, Augusta, Georgia 1935
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**Desmond, Hon. Thomas C[harles], Box 670, Newburgh, New York 1942
Deusing, Murl, Milwaukee Public Museum, Milwaukee 3, Wisconsin 1937
*Dick, John Henry, Dixie Plantation, Meggett, South Carolina 1949
Dickinson, J[oshua] C[lifton], Jr., Museum of Comparative Zoology, Harvard University, Cambridge 38, Massachusetts 1939
Dickinson, Mrs. William Winston (Miriam S.), 2006 Reid Ave., Bluefield, West Virginia 1942
Diesselhorst, G[erd] [Felix], Emmering Hauptstrasse 32, Fürstenfeldbruck bei München, Bayern, Germany, American Zone 1949
*Dingle, Edward von Siebold, Huger, South Carolina 1921
Dittemore, Lester P., 1207 Byron Ave., Topeka, Kansas 1950
Divoky, Robert E[ugene], 1168 E. 78th St., Kansas City 5, Missouri 1950
Dixon, Miss Clara, Albion College, Albion, Michigan 1947
Dixon, J[ames] B[enjamin], Route 3, Box 1143, Escondido, California 1936
Dixon, Keith Lee, Dept. of Wildlife Management, A. & M. College of Texas, College Station, Texas 1946
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Donald, Miss Mary [Frances], 6918 Belmont Lane, Milwaukee 11, Wisconsin 1951
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Dowling, Paul Bruce, 332 W. Dallas St., Mt. Vernon, Missouri 1950
Doyle, William E[ugene], 1426 Alumni Place, Lawrence, Kansas 1952
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Drum, Miss Margaret, 217 South St., Owatonna, Minnesota 1937
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Du Mont, Phillip A[tkinson], 4114 Fessenden St., N.W., Washington 16, D.C. 1928
Dunbar, Munro, North Portal, Saskatchewan, Canada 1950
Dunbar, Robert J[ohn], 106 Glendale Lane, Oak Ridge, Tennessee 1952
Dundas, Lester Harvey, Rice Lake Wildlife Refuge, East Lake, Minnesota 1943

Dunning, John Stewart, Granby, Connecticut 1951
Dunstan, Girvin Raleigh, 5030 Huron River Drive, Route 1, Dexter, Michigan 1950
Durango, Sigfrid, Täby, Sweden 1952
Dusi, Julian L[uigi], Dept. of Zoology & Entomology, Alabama Polytechnic Institute, Auburn, Alabama 1941
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Dyer, William A., 402 John St., Union City, Michigan 1947
Eastman, Whitney H[askins], 2240 W. Lake of Isles Blvd., Minneapolis 5, Minnesota 1941
Eastwood, Sidney Kingman, 5110 Friendship Ave., Pittsburgh 24, Pennsylvania 1928
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Edge, Mrs. Charles N[oel], 1215 Fifth Ave., New York 29, New York 1931
Edwards, Ernest P[reston], Box 611, Amherst, Virginia 1947
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Edwards, Robert Davis, McClellanville, South Carolina 1945
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Edwards, Mrs. Sylvia P. (Mrs. Robert L.), Dept. of Biology, Harvard Univ., Cambridge 38, Massachusetts 1946
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Ellarson, Robert S[cott], 424 Univ. Farm Place, Madison 5, Wisconsin 1948
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Ellis, Miss Hazel Rosetta, Keuka College, Keuka Park, New York 1942
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Elstone, Robert Oliver, 249 Charlton Ave., West, Hamilton, Ontario, Canada 1949
Emerson, David L[owell], 155 Burt St., Taunton, Massachusetts 1939
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English, P[ennoyer] F[rancis], Dept. of Zoology, Pennsylvania State College, State College, Pennsylvania 1934
Ephraim, William A., 1630 Grand Ave., Bronx 53, New York, New York 1952
Erickson, Miss Elsie C., 17012 Endora Road, Cleveland, Ohio 1951
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Erickson, Mary M[arilla], Santa Barbara College, Santa Barbara, California 1930
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Errington, Paul L[ester], Iowa State College, Ames, Iowa 1932
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Everett, Miss Constance Antoinette, 206 Ninth St., N. E., Waseca, Minnesota 1948
Eynon, Alfred E., 5 Beach Road, Verona, New Jersey 1947
Eyster, Marshall Blackwell, Dept. of Biology, Box 545, Southwestern Louisiana Institute, Lafayette, Louisiana 1947
Fairbanks, Mrs. Paul H. (Mrs. Virginia), U. S. Forest Service, Pinehurst Ranger Station, Miramonte, California 1949
Fales, John H[ouse], 1917 Elkhart St., Silver Spring, Maryland 1939
Falls, J. Bruce, 173 Arlington Ave., Toronto, Ontario, Canada 1948
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Fast, Arthur H., 4924 Rock Spring Road, Arlington, Virginia 1950
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Feighner, Miss Lena Veta, 298-I, So. Tremont St., Kansas City 1, Kansas 1935
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Fennell, Chester M[artin], (DAC) Civ. Personnell Sec., Hq. Japan Logistical Command, APO 343, c/o P.M., San Francisco, California 1949
Ferguson, William, 5907 Mason St., Omaha, Nebraska 1946
Fichter, Dr. Edson Harvey, 256 So. 11th Ave., Pocatello, Idaho 1948
Fickett, Steve Burrows, Jr., P.O. Box 343, Branford, Florida 1950
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Findley, J[ohn] Scott, 1201 S. Center Ave., Sioux Falls, South Dakota 1949
Finninger, Paul Charles, Mexico City College, Mexico, D.F., Mexico 1950
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Finster, Miss Ethel B., Louisburg College, Louisburg, North Carolina 1931
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Fisher, Charles Dean, 1164 W. North St., Decatur, Illinois 1952
Fisher, Dorothy A[lice], 125 Ensley St., Huntington, West Virginia 1952
Fisher, Mrs. Glen, Route 3, Box 168, Oshkosh, Wisconsin 1948
Fisher, Harvey I[rvin], Dept. of Zoology, Univ. of Illinois, Urbana, Illinois 1949
Fischer, Richard B[ernard], Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1942
Fleisher, Edward, Brooklyn College, Brooklyn 10, New York 1947
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Foote, Maurice E[dwin], 269 Lawrence St., Ravenna, Ohio 1932
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Foster, John Bristol, 136 Dawlish Ave., Toronto 12, Ontario, Canada 1950
*Foster, John H[awley], P.O. Box 204, Wayne, Pennsylvania 1952
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Fox, Adrian C., Box 1451, Lincoln, Nebraska 1937
Francis, George [Reid], 382 Hillsdale Ave., E., Toronto 12, Ontario, Canada 1949
Fredrickson, Richard William, Apt. 6-D, Sunnyside, Lawrence, Kansas 1947
Freeman, F[rank] J[erome] 2827 Val Verde, N. E., Albuquerque, New Mexico 1951
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Fritzel, Kenneth E., 1125 Reeves Drive, Grand Forks, North Dakota 1952

Frohling, Robert C[harles] (Ensign), USNR, LSS LSM 462, FPO San Francisco, California 1949
Frost, Herbert Hamilton, Ricks College, Rexburg, Idaho 1941
Frye, O. Earle, Jr., Game & Fresh Water Fish Commission, Tallahassee, Florida 1940
Fryman, Miss Kathryn E[lizabeth], 114 Oak St., Wyandotte, Michigan 1943
Fuller, Miss A[nne] Verne, 912 No. Park, Kalamazoo, Michigan 1952
Furniss, Owen C[ecil], P.O. Box 756, Alberni, Vancouver Island, British Columbia, Canada 1934
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Gaede, Adela, 3903 E. 176th St., Cleveland 28, Ohio 1951
Gairloch, Stanley S[tanford], Route 2, North Scituate, Rhode Island 1948
Gale, Larry R[ichard], 167 Harrod Ave., Frankfort, Kentucky 1948
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Gallup, Frederick Norman, P.O. Box 614, Escondido, California 1947
**Gammell, Dr. R[obert] T[heodore], Kenmare, North Dakota 1943
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Gardner, Kenneth V., Route 1, Groton, New York 1952
Garlick, Gordon Mark, Route 1, Box 408, Lake Orion, Michigan 1951
Garner, William V[aughn], 447 E. Wadsworth St., Philadelphia 19, Pennsylvania 1948
Garrett, Miss [Mary] Lois, 1709 Chestnut St., Kenova, West Virginia 1942
Garrison, David L[loyd], Old Lexington Road, Lincoln, Massachusetts 1940
Garrity, Devin A[dair], 23 E. 26th St., New York 10, New York 1949
Gashwiler, Jay S., U. S. Fish & Wildlife Service, 110 Pioneer Post Office Bldg., Portland, Oregon 1944
Gates, Miss Doris [Berta], 401 South Ash St., North Platte, Nebraska 1948
Gates, Mabelle F. (Mrs. Clough), 714 Sixth Ave., E., Superior, Wisconsin 1949
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Geibel, Miss Margaret, 127 Mercer St., Butler, Pennsylvania 1952
Gensch, Robert Henry, 105 Clark Ave., Billings, Montana 1939
Geoghegan, John T[homas], 40 Sherman St., Port Chester, New York 1951
*George, John L[othar], Division of Conservation, Vassar College, Poughkeepsie, New York 1939
Gerstell, Richard, 355 North West End Ave., Lancaster, Pennsylvania 1939
Getzendaner, Mrs. Georgia Belle, 1814 Santa Fe, Corpus Christi, Texas 1950
Gibson, George G[ordon], 265 Sheldrake Blvd., Toronto, Ontario, Canada 1949
Gibson, Col. Robert Howard, Route 2, Box 336, St. Helena, California 1949
Gier, Herschel T[homas], Dept. of Zoology, Kansas State College, Manhattan, Kansas 1937
Gifford, Harold, 3636 Burt, Omaha 3, Nebraska 1936
Gilbert, Miss Kathryn Helen, 714 First Ave., W., Grand Rapids, Minnesota 1945
Gill, Geoffrey, 24 Overlook Drive, Huntington, Long Island, New York 1950
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Gilliard, Ernest Thomas, American Museum of Natural History, Central Park West and 79th St., New York 24, New York 1949
Gilreath, Miss M. Ruth, Box 23, Travelers Rest, South Carolina 1952
Ginn, William Edward, 511 E. Van Buren, Columbia City, Indiana 1941
Glazier, William H[enry] M[onroe], 36 High St., Peterborough, New Hampshire 1948
Glenn, Robert W., 509 Orchard Ave., Avalon, Pittsburgh 2, Pennsylvania 1934
Glick, Bruce, 2062 17th Ave., Columbus, Ohio 1949
Glore, W[alter] S[cott], Jr., 350 Maple Ave., Danville, Kentucky 1947
Glover, Fred A[rthur], Wildlife Management, Humboldt State College, Arcata, California 1947
Goebel, Herman [John], 78-52 80th St., Brooklyn 27, New York 1946
Goellmer, Karl Eugene, Coe College, Cedar Rapids, Iowa 1950
*Goetz, Christian John, 3503 Middleton Ave., Cincinnati 20, Ohio 1930
Good, Ernest E[ugene], Dept. of Zoology & Entomology, Ohio State University, Columbus 10, Ohio 1937
Good, Wallace M., 3 Reidcrest, Kansas City, Kansas 1949

Goodman, Donald C[harles], 705 W. Main St., Urbana, Illinois 1952
Goodman, John David, Biology Dept., Univ. of Redlands, Redlands, California 1944
Goodpasture, Mrs. Ernest W., 408 Fairfax Ave., Nashville 5, Tennessee 1950
Goodwin, Clive Edmund, 38 Walsh Ave., Weston, Ontario, Canada 1952
Goslin, Charles R[ussell], 726 E. King St., Lancaster, Ohio 1940
Gosner, K[enneth] Lynn, 698 Clifton Ave., Newark, New Jersey 1948
Gowanloch, James Nelson, Dept. of Wildlife & Fisheries, 126 Civil Courts Bldg., New Orleans, Louisiana 1950
Graaskamp, Lester William, Washington Ave., Irvington-on-Hudson, New York 1949
Graber, Richard R., 1013 Polk St., Topeka, Kansas 1949
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Grange, Wallace, Babcock, Wisconsin 1930
Grant, Cleveland P[utnam], 245 Davis St., Mineral Point, Wisconsin 1928
Grayce, Robert, 141 Main St., Rockport, Massachusetts 1946
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Green, Mrs. Charlotte Hilton, 3320 White Oak Road, Raleigh, North Carolina 1952
Green, N[orman] Bayard, Zoology Dept., Marshall College, Huntington 1, West Virginia 1943
*Greene, Albert E., 517 Oswego St., Ann Arbor, Michigan 1939
Greenhalgh, Clifton M., P.O. Box 326, Murray, Utah 1939
Greenwalt, Ernest J., Wichita Refuge, Cache, Oklahoma 1950
*Greer, Rev. Edward C., 422 E. 10th St., Davenport, Iowa 1948
Gregory, Stephen S[trong], Jr., Box N., Winnetka, Illinois 1922
Griffee, W[illet] E., 510 Yeon Bldg., Portland 4, Oregon 1947
Griffin, William W[elcome], 3232 Pine Ridge Road, N. E., Atlanta, Georga 1946
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Grimm, William C[arey], Route 2, Box 95H, Georgetown, South Carolina 1939
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Groesbeck, William M[aynard], 376 Seneca Road, Hornell, New York 1947
Grose, E. R., Box 38, Sago, West Virginia 1939
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Gross, Alfred Otto, 11 Boody St., Brunswick, Maine 1927
Grossenheider, Richard P., 6328 Laura Ave., St. Louis 20, Missouri 1952
Grow, Raymond J., 513 W. Fifth Ave., Apt. 7, Gary, Indiana 1951
Grube, G[eorge] E[dward], Biology Dept., Gettysburg College, Gettysburg, Pennsylvania 1948
Gruenewald, Robert Franklin, Clifton, Illinois 1948
Guhl, A[lphaeus] M[atthew], Dept. of Zoology, Kansas State College, Manhattan, Kansas 1948
Gullion, Gordon W[right], 624 Avenue I, Boulder City, Nevada 1947
Gumbart, William B., P.O. Box 1936, New Haven 9, Connecticut 1952
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Gundy, Samuel C[harles], Box 1, Stony Creek Mills, Pennsylvania 1950
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Hall, Fran, 518 Union St., Northfield, Minnesota 1950
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Halladay, Ian R[ussel], 218 Belsize Drive, Toronto 12, Ontario, Canada 1948
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Hallman, Roy Cline, Box 435, Port St. Joe, Florida 1928
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Hamerstrom, Frederick N., Jr., Plainfield, Wisconsin 1934
Hamilton, Carmen W[arnke] (Mrs. Don F.), Melody Hill, Route 2, Box 89, Hopkins, Minnesota 1951
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Hamilton, Terrell Hunter, 1926 Swenson Ave., Abilene, Texas 1952
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Hartley, Albert Thomas, Columbiana, Ohio 1944
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Henry, C. J., Seney National Wildlife Refuge, Germfask, Michigan 1933
Hensley, M[arvin] Max, Dept. of Biology, Gettysburg College, Gettysburg, Pennsylvania 1947
Henwood, Mrs. Ethel May, 806 S. Lincoln, Urbana, Illinois 1941
Herbert, Richard A., 961 Fox St., Bronx 59, New York, New York 1951
Herman, Carlton M., Patuxent Research Refuge, Laurel, Maryland 1946
Herreman, Mrs. H. M., 2931 W. Roxboro Road, N. E., Atlanta, Georgia 1951
Herz, Mrs. Malvin E., Route 4, Excelsior, Minnesota 1951
Hessin, Miss Twila, Route 2, Nashport, Ohio 1949
Hesterberg, Gene A[rthur], Forestry Dept., Michigan College of Mining and Technology, Houghton, Michigan 1948
Hetrick, Louis Howard, Gettysburg Lutheran Seminary, Gettysburg, Pennsylvania 1950
Hewitt, Oliver H., Fernow Hall, Cornell Univ., Ithaca, New York 1943
Hibbard, Edmund Arthur, 602 12th St., Bismarck, North Dakota 1950
Hickey, J[oseph] J[ames], 424 University Farm Place, Madison 5, Wisconsin 1940
**Hicks, Lawrence Emerson, 8 Chatham Road, Columbus, Ohio 1925
Hicks, Thomas W[illiam], Dept. of Biol., Science Hall, Univ. of Florida, Gainesville, Florida 1949
Hiett, Lawrence D[avison], 1945 Ottawa Dr., Toledo 6, Ohio 1929
Higgins, Thomas Francis, Box 95, Miller Place, Long Island, New York 1947
Hill, Herbert Oliver, 1811 Bonita, Berkeley, California 1938
Hill, Julian Werner, 1106 Greenhill Ave., Wilmington 56, Delaware 1935
Hill, R[aymond] W., 3316 Kenmore Rd., Shaker Heights, Cleveland 22, Ohio 1941
Hillmer, Davis B., 8228 Woodward Ave., Detroit 2, Michigan 1926
Hinds, Frank J., Biology Dept., Western Michigan College of Education, Kalamazoo, Michigan 1935

Hinshaw, Thomas D[oane], 1827 San Juan Ave., Berkeley 7, California 1926
Hipple, Byron T., Jr., 46 Dove St., Albany 10, New York 1952
Hobson, Mrs. L. G. (Dorothy Madden), 4515 Marcy Lane, Apt., 239, Indianapolis 5, Indiana 1935
Hochbaum, Hans Albert, Delta Waterfowl Research Sta., Delta, Manitoba, Canada 1942
Hock, Raymond J[ames], Box 960, Arctic Health Research Center, Anchorage, Alaska 1946
Hodges, Mrs. Elizabeth D[ole], 6210 Paseo, Kansas City 4, Missouri 1948
Hodges, James, 324 W. 31st St., Davenport, Iowa 1946
Hoffmeister, Linus C[hristian], 504 W. Ripa Ave., Lemay 23, Missouri 1939
Hofslund, Pershing B[ernard], Biology Dept., Duluth Branch, Univ. of Minnesota, Duluth, Minnesota 1944
Holberg, Arnold, Route 3, Box 226, El Dorado, Arkansas 1951
*Holden, Fenn M[itchell], Box 428, Grayling, Michigan 1947
Holland, Harold May, Box 615, Galesburg, Illinois 1915
Horn, Frank E., 538 E. 21st St., Brooklyn 26, New York 1952
Horton, Mrs. Louise D. (Mrs. M. B.), 360 Prospect St., Fall River, Massachusetts 1941
Hostetter, D[avid] Ralph, Eastern Mennonite College, Harrisonburg, Virginia 1937
Hough, Mrs. Eleanor Sloan, 1645 Sunset Blvd., Boulder, Colorado 1941
Houston, C[larence] Stuart, Box 279, Yorkton, Saskatchewan, Canada 1948
Howard, Julian A., Aransas National Wildlife Refuge, Austwell, Texas 1951
Howe, [Henry] Branch, Jr., 1710 Hoyt St., Madison, Wisconsin 1943
Howell, Joseph C., Dept. of Zoology & Entomology, Univ. of Tennessee, Knoxville 16, Tennessee 1938
Howell, Thomas R[aymond], Dept. of Zoology, Univ. of California, Los Angeles 24, California 1947
Hoyt, Mrs. Sally F. (Mrs. Southgate Y.) "Aviana," Box 54, Etna, New York 1952
Hubert, Philip Arthur, Jr., 161 Henry St., Apt. 5-S, Brooklyn 2, New York 1948
Huenecke, Howard S[everin], Des Lacs National Wildlife Refuge, Kenmare, North Dakota 1952
Hughes, Wallace, 624 S.W. 51st St., Oklahoma City, Oklahoma 1947
Hulbert, Lloyd Clair, Dept. of Botany, Univ. of Minnesota, Minneapolis 14, Minnesota 1938
Humphrey, Philip Strong, Museum of Zoology, Univ. of Michigan, Ann Arbor, Michigan 1948
*Hundley, Marion Lee, 155 3rd St., S.E. Carrollton, Ohio 1950
Hunnewell, Miss Louisa, 848 Washington St., Wellesley, Massachusetts 1951
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Hurley, John B[eatty], 401 S. 17th Ave., Yakima, Washington 1937
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Imhof, Thomas A[nthony], 307 38th St., Fairfield, Alabama 1950
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Irving, Laurence, Box 960, Anchorage, Alaska 1951
Ivor, H. Roy, Route 1, Cooksville, Ontario, Canada 1945
Jabinson, Marguerite N. (Mrs. L. R.), 1503 N. Pennsylvania Ave., Apt. 31, Indianapolis 2, Indiana 1946
Jackson, C[icero] F[loyd], Univ. of New Hampshire, Durham, New Hampshire 1936
Jacobson, Dr. Malcolm A[rthur], 13 W. 36th St., New York 19, New York 1947
Jahn, Laurence Roy, 314 W. Lake St., Horicon, Wisconsin 1950
James, Douglas Arthur, Vivarium Bldg., Univ. of Illinois, Champaign, Illinois 1946
James, Miss Pauline, Biology Dept., Texas College of Arts & Industries, Kingsville, Texas 1952
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Janssen, Robert B., 5128 Indianola Ave., Minneapolis 10, Minnesota 1952
Janvrin, Dr. Edmund R[andolph] P[easlee], 38 E. 85th St., New York 28, New York 1942

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Jaques, Florence Page, 610 W 116th St., New York 27, New York 1950
Jaques, H[arry] E[dwin], 709 N. Main St., Mt. Pleasant, Iowa 1949
Jenkins, James H[obart], Dept. of Biology, Univ. of Georgia, Athens, Georgia 1939
Jenkinson, Miss Mary Caroline, Box 715, Bryson City, North Carolina 1952
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Jensen, Mrs. Ove F., Rural Route, Maple City, Michigan 1948
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Johnson, Albert George, 271 South St., Jamaica Plain 30, Massachusetts 1947
Johnson, Daniel P., 147 Winter St., Hyannis, Massachusetts 1951
Johnson, Harris E., Route 1, Warren, Pennsylvania 1951
Johnson, Mrs. Irene W. (Mrs. Oscar), 38 Portland Place, St. Louis 8, Missouri 1931
Johnson, J[ohn] O[scar], 112 7th St., S.E., Watertown, South Dakota 1948
Johnson, Miss Mabel Claire, 30 Westfield Rd., West Hartford, Connecticut 1946
Johnson, Robert A[nthony], 98 East St., Oneonta, New York 1930
Johnson, William M[cNutt], Route 6, Knoxville, Tennessee 1939
Johnston, David Ware, Dept. of Zoology, Univ. of California, Berkeley 4, California 1943
Johnston, Richard F., Museum of Vertebrate Zoology, Berkeley 4, California 1949
Jones, Fred M[inson], P.O. Box 1864, Williamsburg, Virginia 1951
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Jones, Harold C[harles], Box 61, East Carolina Teachers College, Greenville, North Carolina 1929
Jones, John C[ourts], 5810 Namakagan Rd., Washington 16, D.C. 1931
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Joseph, Stanley R[obert], Route 8, York, Pennsylvania 1952
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Jubon, John M., P.O. Box 16, Millstone Rd., East Millstone, New Jersey 1951
Jung, Clarence [Schram], 6383 N. Port Washington Rd., Milwaukee 9, Wisconsin 1921
Jurica, E., Lisle, Illinois 1940
Kaerne, William H[arald], 127 Ruby St., Winnipeg, Manitoba, Canada 1949
Kahn, Mrs. Dina H[ope] (Mrs. Reuben L.), 1122 Michigan Ave., Ann Arbor, Michigan 1938
Kalmbach, Edwin Richard, Fish & Wildlife Service, 2654 Forest St., Denver 7, Colorado 1926
Kampf, Roy C., 555 Ruth St., Bridgeport, Connecticut 1948
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Kasper, John L[oren], 392 23rd St., Oshkosh, Wisconsin 1947
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Keeton, Luther F., 26 N. Belvedere Blvd., Memphis 4, Tennessee 1952
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Keller, Richard T[homas], 717 S. 16th St., St. Joseph 36, Missouri 1943
Kelley, Mrs. Eliza Mabel, 6 Ashton St., Worchester, Massachusetts 1948
Kelley, Neil Thomas, 13137 Balfour, Huntington Woods, Michigan 1951
Kelley, William N[eal], New Haven, Missouri 1948
Kelsey, Homer Stone, Skyview Acres, Route 1, Pomona, New York 1945
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Kelso, Leon H[ugh], 1370 Taylor St., N.W., Washington 11, D.C. 1930
Kelson, Keith R[eynold], Museum of Natural History, University of Kansas, Lawrence, Kansas 1952
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Kenaga, Eugene E., 1629 Isabella Road, Route 5, Midland, Michigan 1949
Kendeigh, S[amuel] Charles, Univ. of Illinois, Vivarium Bldg., Champaign, Illinois 1923
*Kennedy, Bruce A[lbert] H[amilton], 389 W. 10th Ave., Columbus 1, Ohio 1947
*Kennerly, Thomas E., Jr., Dept. of Zoology, Univ. of Texas, Austin 12, Texas 1951
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Kenyon, Karl W[alton], U.S. Fish & Wildlife Service, 2725 Montlake Blvd., Seattle 2, Washington 1948
Kersey, Mrs. Glenn B. (Lula Brooks), 647 Gordon Terrace, Chicago 13, Illinois 1948
Kersting, Cecil Carl, 3722 E. Apple, Route 6, Muskegon, Michigan 1950
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Kildow, T[homas] Monroe, Box 520, Tiffin, Ohio 1948
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Killip, Dr. Thomas, III, 904 South Ave., Rochester, New York 1946
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Kimball, Miss Mary Boydston, 809 Main St., Sistersville, West Virginia 1950
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King, John Arthur, Roscoe B. Jackson Memorial Laboratory, Box 847, Hamilton Sta., Bar Harbor, Maine 1947
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Kirkpatrick, Charles M., Dept. of Forestry, Purdue Univ., West Lafayette, Indiana 1948
*Klein, Richard P[aul], Jackson Road, Route 4, Chagrin Falls, Ohio 1946
*Kletzly, Robert C[harles], Conservation Commission, Romney, West Virginia 1948
Klimstra, W[illard] D[avid], Zoology Dept., Southern Illinois Univ., Carbondale, Illinois 1948
Klonick, Allan S., 828 Grosvenor Road, Rochester 18, New York 1941
Kluge, Miss Helen H[enrika], Woodtick Road, Waterbury 12, Connecticut 1942
Knisely, Holton, Gregory, Michigan 1951
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Kossack, Charles W[alter], 715 S. Division St., Barrington, Illinois 1945
Kozicky, Edward L[ouis], Wildlife Research Unit, Dept. of Zoology & Entomology, Iowa State College, Ames, Iowa 1943
Kramar, Nada, 1906 "K" St., N.W., Washington 6, D.C. 1947
Kraus, Douglas L[awrence], Univ. of Rhode Island, Dept. of Chemistry, Kingston, Rhode Island 1942
Krebs, Mrs. R. W. (Juanita F[ile]), 1272 Alfred St., Baton Rouge 12, Louisiana 1946
Krug, Howard H[enry], Chesley, Ontario, Canada 1944
Krumm, Kenneth, Lacreek National Wildlife Refuge, Martin, South Dakota 1948
Kugel, Miss Agnes R[ose], Botany Dept., Grand Rapids Junior College, Grand Rapids, Michigan 1946
Kuhn, Kenneth H[erbert], 3734 No. 53rd St., Milwaukee 16, Wisconsin 1949
Kuitert, Louis Cornelius, Agricultural Experiment Sta., Univ. of Florida, Gainesville, Florida 1938
Kutz, George C[arl], 705 So. Holcombe St., Stillwater, Minnesota 1944
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Lacey, Miss Mifton H., Box 614, Canton, Ohio 1939
Lacey, Mrs. Trammell Calhoun, Box 4, North St. Sta., Nacogdoches, Texas 1950
Lagler, Karl F., Dept. of Fisheries, Univ. of Michigan, Ann Arbor, Michigan 1941
Lambert, Mrs. Adaline T[rain] (Mrs. Howard T.), 1903 Ross St., Sioux City, Iowa 1947
Lamore, Donald Hart, 10-A Parkway Road, Greenbelt, Maryland 1952

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Land, Hugh Colman, 3372 8th St. Road, Huntington, West Virginia 1950
Larrabee, Austin Park, 534 99th Ave., N.E., Bellevue, Washington 1921
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Latimer, Miss Alice Roana, Editorial Office, Agricultural Experimental Sta., Pennsylvania State College, State College, Pennsylvania 1950
Latzko, Gordon Charles, Apt. 37, Vets' Housing, Muhlenberg College, Allentown, Pennsylvania 1948
Laude, Peter P[ercy], 302 W. Park Road, Iowa City, Iowa 1951
Lawrence, Mrs. Louise de Kiriline, Rutherglen, Ontario, Canada 1946
Lawson, Ralph, 88 Washington Square, Salem, Massschusetts 1951
Lea, Dr. Robert B[ashford], 1640 Dufossat, New Orleans 15, Louisiana 1940
Leavitt, Benjamin Burton, Department of Biology, University of Florida, Gainesville, Florida 1947
Lee, [William] Donald, 3219 White Oak Drive, Dayton 10, Ohio 1947
Lee, Miss Zell Charlotta, 815 Jackson St., Apt. 4, Sioux City, Iowa 1946
Leedy, Daniel L[oney], U.S. Fish & Wildlife Service, Branch of Wildlife Research, Washington 25, D.C. 1936
Leggett, Fred C[arlisle], Rural Route, McIvor, Michigan 1952
*Lengemann, Miss Martha A., 360 Cedar St., Imlay City, Michigan 1946
Leonard, James P[atrick], 1605 Arlington Avenue, Davenport, Iowa 1951
Leopold, A[ldo] Starker, Museum of Vertebrate Zoology, Berlekey 4, California 1940
Leopold, Frederic, 111 Clay St., Burlington, Iowa 1950
Leppla, Miss Doris E., 510 West Front St., Ashland, Wisconsin 1951
*Levi, Herbert W., University of Wisconsin, Extension Center, Wausau, Wisconsin 1949
Levy, Alice K[lund] (Mrs. H. P.), 840 Seward St., Hollywood 38, California 1941
Lewis, C. Bernard, The Science Museum, Institute of Jamaica, Kingston, Jamaica, British West Indies 1947
Lewis, Harrison F[lint], West Middle Sable, Shelburne County, Nova Scotia, Canada 1939
Lewis, Brother Hubert, La Salle Institute, Glencoe, Missouri 1940
Lewy, Alfred, 2051 E. 72nd Place, Chicago 49, Illinois 1915
Lieftinck, John E[dmund], c/o Goodyear S.A., Luxembourg City, Luxembourg 1945
Lien, Mrs. Boyd M. (Mrs. Helen J.), 5148 29th Avenue So., Minneapolis 17, Minnesota 1944
**Ligas, Frank J., Stone Institute of Hydrobiology, Put-In-Bay, Ohio 1951
Ligon, J[ames] Stokley, P.O. Box 950, Carlsbad, New Mexico 1948
Lincoln, Frederick Charles, Fish & Wildlife Service, Washington 25, D.C. 1914
Lindauer, Millard R., 8509 Atlantic Ave., Margate, New Jersey 1949
Linsdale, Jean M[yron], Jamesburg Route, Robles Del Rio, California 1928
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Lloyd, C[lark] K., 11 No. Elm St., Oxford, Ohio 1925
Lloyd, Hoyes, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ontario, Canada 1922
*Lockwood, Robert Minturn, Veterans Administration Hospital, McKinney, Texas 1949
Loetscher, Frederick W[illiam], Jr., 507 W. Main St., Danville, Kentucky 1946
*Logan, Dulaney, Rural Route 1, Box 449, Louisville 1, Kentucky 1947
Long, Ralph, Jr., 300 West Ave., Ithaca, N. Y. 1951
Longley, William H[oward], P.O. Box 362, Kasson, Minnesota 1943
Lord, Dr. Frederic P[omeroy], 39 College St., Hanover, New Hampshire 1939
Loring, George G[ardner], Bridge 57, Manchester, Massachusetts 1949
Lovell, Harvey B., 3011 Meade Ave., Louisville 13, Kentucky 1936
**Low, Seth Haskell, Patuxent Research Refuge, Laurel, Maryland 1931
**Lowery, George H[ines], Jr., Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana 1937
Lowther, Malcolm Alfred, 706 Hazelwood, Detroit, Michigan 1944
Ludwig, Claud C[ecil], 279 Durand St., East Lansing, Michigan 1938
**Ludwig, Dr. Frederick Edwin, 2864 Military St., Port Huron, Michigan 1941
Lueshen, Mrs. John [Willetta], Wisner, Nebraska 1952

Lukens, William Weaver, Jr., Upper Gulph Road, Radnor, Pennsylvania 1947
Lund, Mrs. Oscar, Baroda, Michigan 1952
Lundin, Harry, Sparbanksvägen 11, Hägersten, Sweden 1948
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Lupient, Mrs. Mary [Louise], 212 S. E. Bedford St., Minneapolis 14, Minnesota 1944
Luthy, Ferd, Jr., 306 N. Institute, Peoria, Illinois 1937
Lyons, Mrs. Rhoda Green (Mrs. Robert), 25 Woodland St., Huntington, New York 1940
MacLeod, Charles Franklyn, Box 5215, State College Station, Raleigh, North Carolina 1949
MacLulich, D[uncan] A[lexander], 342 Marshall Court, Ottawa, Ontario, Canada 1933
MacMillan, (Mrs.) Jeanette Courte, 2878 Ziegle Ave., Cincinnati 8, Ohio 1952
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MacQueen, Mrs. Peggy Muirhead, 48 New Jersey Ave., Bergenfield, New Jersey 1940
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McCamey, [Benjamin] Frank[lin], [Jr.], c/o E. E. Weeks, Storrs, Connecticut 1945
McCart, William L[arrey], 1309 St. Louis Ave., Fort Worth 4, Texas 1950
*McClure, H[owe] Elliott, 406 Medical Gen. Lab., A.P.O. 500, San Francisco, California 1942
McClure, John Francis, 7050 N. Oatman Ave., Portland 17, Oregon 1949
*McConoughey, Frank Perry, 1547 Northland Ave., Lakewood 7, Ohio 1951
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McDonald, Malcolm E., Box 236, Schenectady, New York 1936
McEntee, Mrs. Howard G. (Elinor G.), 490 Fairfield Ave., Ridgewood, New Jersey 1948
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McKay, Arlie K[yle], Rural Route 2, Box 252, Baytown, Texas 1949
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McKeever, J[ames] L[awrence], Rural Route 3, Peterborough, Ontario, Canada 1949
McKinley, Daniel L[awson], Mountain Grove, Missouri 1948
McKinley, Dr. George G[ael], 104 North Western Pkwy., Louisville 12, Kentucky 1945
McKinney, Robert G[erhard], 86 Hurstbourne Road, Rochester 9, New York 1948
*McKinney, Mrs. Walter A., 2932 So. Woodward Blvd., Tulsa 5, Oklahoma 1945
McKnight, Edwin T[hor], 5038 Park Place, Friendship Station, Washington 16, D. C. 1936
*McLeod, John Allen, Jr., 113 E. Hendrix St., Greensboro, North Carolina 1951
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McMillan, John Frank, 1414 E. 59th St., Chicago 37, Illinois 1950
McMurray, Arthur A., 1216 W. Bethune, Apt. B-6, Detroit 2, Michigan 1939
McQuarrie, Harold James, Gore Bay, Manitoulin Island, Ontario, Canada 1950
Mack, H[orace] G[ordon], c/o Gilson Mfg. Co., Ltd., Guelph, Ontario, Canada 1937
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*Mackenzie, Dr. Locke Litton, 829 Park Ave., New York 21, New York 1947
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Magath, Dr. Thomas Byrd, Mayo Clinic, Rochester, Minnesota 1935
Magner, J[ohn] Marshall, 516 Bacon Ave., Webster Groves 19, Missouri 1948
Magney, Mrs. G. R., 5329 Washburn Ave., So., Minneapolis 10, Minnesota 1951
Maher, William Joseph, 915 Oakland Ave., Ann Arbor, Michigan 1951
Mahlburg, Milton William, 1109 Grant Ave., Rockford, Illinois 1949
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Manley, Thomas L., 1919 Semple Ave., St. Louis 12, Missouri 1952

Manners, Edward Robert, 216 New Broadway, Brooklawn, New Jersey 1942
Manning, T. H., 37 Linden Terrace, Ottawa, Canada 1950
*Mannix, Mrs. Lucille Marie (Mrs. J. R.), 11424 Cedar Road, Apt. E-2, Cleveland, Ohio 1947
Manville, Richard H[yde], Dept. of Zoology, Michigan State College, East Lansing, Michigan 1941
*Mara, Robert M[ichael], The Dearborn Inn, Dearborn, Michigan 1949
Marfield, George R[owland], 1820 So. Olive Ave., Alhambra, California 1948
Markle, Millard S., Earlham College, Richmond, Indiana 1948
Marks, Jack Loran, 115 City Hall, Director of Zoo, Portland 4, Oregon 1949
Marshall, A. J., Dept. of Zoology & Comparative Anatomy, St. Bartholomew's Hospital Medical College, Charterhouse Square, London E.C. 1, England 1950
Marshall, Joe T[ruesdell], Jr., Dept. of Zoology, University of Arizona, Tucson, Arizona 1951
Marshall, Raymond O[scar], Route 2, Columbiana, Ohio 1945
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Marshall, William H[ampton], Div. of Entomology & Econ. Zoology, University Farm, St. Paul 1, Minnesota 1942
Martin, Keith Emrie, 232 Douglas Ave., Naperville, Illinois 1952
Martin, Paul S[chultz], Division of Herpetology, Museum of Zoology, Ann Arbor, Michigan 1946
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Mayfield, G[eorge] R[adford], Vanderbilt University, Nashville, Tennessee 1917
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**Mayr, Ernest, American Museum of Natural History, 79th St. & Central Park, W., New York 24, New York 1933
Mazzeo, Rosario, 120 Elm St., North Cambridge 40, Massachusetts 1947
Meacham, Frank B., State Museum, Raleigh, North Carolina 1945
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Meanley, Brooke, 4710 Keswick Road, Baltimore 10, Maryland 1950
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Meltvedt, Burton W., Paullina, Iowa 1930
**Meng, Heinz Karl, 116 Miller St., Ithaca, New York 1943
*Mengel, Jane S[trahan] (Mrs. Robert M.), 20 East Shore Drive, Whitmore Lake, Michigan 1948
*Mengel, Robert M[orrow], 20 E. Shore Drive, Whitmore Lake, Michigan 1937
*Menninger, Phil B., 1724 Collins Ave., Topeka, Kansas 1949
Meredith, Col. Russell Luff, c/o General Delivery, Augusta, Montana 1946
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Metcalfe, Mrs. Bruce, Thistletown, Ontario, Canada 1952
Mewaldt, L[eonard] R[ichard], Department of Zoology, Washington State College, Pullman, Washington 1947
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*Mitchell, Mrs. Osborne, Cobast, Caixa Postal 4965, Rio de Janeiro, Brazil 1933
*Mitchell, Mrs. R. V., East Dr., Congress Lake, Hartville, Ohio 1943
Mitchell, Miss Verna E., 1900 "F" St., N. W., Apt. 623, Washington 6, D. C. 1949
*Mitchell, Walton I[ungerich], 398 Vassar Ave., Berkeley 8, California 1893
Mockford, Edward [Lee] Biology Dept., Box 221, University of Florida, Gainesville, Florida 1946
Moe, Owen A[rnold], 3651 Glenhurst Ave., Minneapolis 16, Minnesota 1951
Mohler, Levi L[app], 1000 S. 35th St., Lincoln, Nebraska 1942
Mohr, Charles E[dward], Audubon Nature Center, Greenwich, Connecticut 1947
Monk, Harry C[rawford], 406 Avoca St., Nashville 5, Tennessee 1920
Monroe, Burt L[eavelle], Jr., Ridge Road, Anchorage, Kentucky 1946
**Monroe, Burt L[eavelle], Sr., Ridge Road, Anchorage, Kentucky 1935
Monroe, Mrs. Robert A[nsley], 1424 Tugaloo Dr., Knoxville, Tennessee 1952
Monson, Gale, P. O. Box 1717, Parker Arizona 1933
Moore, Miss Dora, French Creek, West Virginia 1934
Moore, Mrs. [Margaret Rodes] McBrayer, 335 W. Lexington St., Danville, Kentucky 1950
Moore, Robert B[yron], 1332 Alfred St., Baton Rouge 6, Louisiana 1947
**Moore, Robert Thomas, Meadow Grove Place, Flintridge, Pasadena 2, California 1939
Moran, James Vincent, H M 2, Hdq. Support Act., Navy 510, Box 19, FPO, New York, New York 1943
Moreno, Abelardo, Museo Poey, Catedra "U", Escuela de Ciencias, University of Havana, Havana, Cuba 1949
Morony, John J., Jr., Box 1114, Alamo, Texas 1951
Morrell, Charles K., 119 E. Maxwell St., Lexington, Kentucky 1943
Morrison, Kenneth Douglas, c/o National Audubon Society, 1130 Fifth Ave. New York, New York 1937
Morrissey, Thomas J[ustin], 325 McClellan Blvd., Davenport, Iowa 1946
*Morrow, Mrs. Dessie Powers (Mrs. John, Jr.), 1320 N. State St., Chicago 10, Illinois 1949
*Morse, Margarette Elthea, 122 W. South St., Viroqua, Wisconsin 1921

Mosby, Henry Sackett, Box 838, Blacksburg, Virginia 1951
Moser, Jane Myers (Mrs. R. Allyn), 90th & Farnam, Omaha 6, Nebraska 1946
*Moser, Dr. R[euben] Allyn, 90th & Farnam, Omaha 6, Nebraska 1940
Moser, Randolph, Apt. D, 470 E. Washington St., Pasadena 6, California 1944
Mossman, H[arland] W[infield], 2902 Columbia Road, Madison 5, Wisconsin 1948
Moule, John W[illiam], 68 North Oval St., Hamilton, Ontario, Canada 1948
*Muckley, Mrs. R. L. (Marion), 1335 Astor St., Chicago 10, Illinois 1950
*Mudge, Edmund W., Jr., 5926 Averill Way, Dallas Texas 1939
*Mueller, Mrs. Florence N., 4408 Pine St., Omaha 5, Nebraska 1951
Mueller, Helmut Charles, 2756 N. Palmer St., Milwaukee 12, Wisconsin 1949
Muhlbach, W[alt] L[auritz], Department of Zoology & Entomology, Ohio State University, Columbus 10, Ohio 1951
Mumford, Russell E[ugene], Rural Route 1, Cortland, Indiana 1949
Munter, Rear Admiral W[illiam] H[enry] (Retired), 4518 52nd Ave., N.E., Seattle, Washington 1933
Murie, Adolph, Moose, Wyoming 1932
Murie, O[laus] J[ohan], Moose, Wyoming 1934
*Murphy, Paul C[harles], 935 Goodrich Ave., Apt. 10, St. Paul 5, Minnesota 1944
Murray, Rev. J[oseph] J[ames], 6 White St., Lexington, Virginia 1931
Musgrove, Jack W[arren], 2414 Adams Ave., Des Moines 10, Iowa 1947
Musselman, T[homas] E[dgar], 124 So. 24th St., Quincy, Illinois 1940
Myers, Buford M[acMartin], Jr., 65 Oakland St., New Orleans 21, Louisiana 1948
Nathan, Bernard, 224 Elmwood Ave., Buffalo 22, New York 1952
Neal, Mrs. Charles (Dorothy Phillips), Box 133, Demorest, Georgia 1946
Neff, Johnson Andrew, Bldg. 45, Denver Federal Center, Denver 2, Colorado 1920
Nelson, Arnold Lars, 3256 Van Hazen, N.W., Washington 15, D.C. 1932
Nelson, Charles E[llsworth], Jr., 124 Oxford Road, Waukesha, Wisconsin 1937
**Nelson, Miss Theodora, 315 E. 68th St., New York 21, New York 1928
Nelson, T. W., 432 Jewell Ave., Topeka, Kansas 1949
Nelson, Urban C., Box 1887, Juneau, Alaska 1939
Nero, Robert William, Department of Zoology, University of Wisconsin, Madison 5, Wisconsin 1947
Ness, Robert D., 1177 Winton Road, S., Rochester 18, New York 1951
Nessle, James P., 1823 Barrows St., Toledo 13, Ohio 1936
*Netting, M[orris] Graham, Carnegie Museum, Pittsburgh 13, Pennsylvania 1941
Nevius, Mrs. Richard, Rural Route 1, Greeneville, Tennessee 1940
New, John G., Rural Route 5, Scranton Rd., Hamburg, New York 1946
Newberry, A[ndrew] Todd, 70 Rock Spring Rd., West Orange, New Jersey 1952
Newman, Robert J[ames], Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana 1950
Nice, L[eonard] B., 5725 Harper Ave., Chicago 37, Illinois 1932
**Nice, Mrs. Margaret Morse, 5725 Harper Ave., Chicago 37, Illinois 1921
*Nichols, Charles K[etcham], 212 Hamilton Rd., Ridgewood, New Jersey 1933
Nichols, John Treadwell, American Museum of Natural History, 79th St. and Central Park, W., New York 24, New York 1941
Nichols, L[eon] Nelson, 331 E. 71st St., New York, New York 1937
Nicholson, Donald John, 1224 Palmer St., Orlando, Florida 1945
Nickell, Walter Prine, Cranbrook Institute of Science, Bloomfield Hills, Michigan 1943
Nields, James F[ulton], Jr., Hardwick, Massachusetts 1949
*Nielsen, Mrs. B[eatrice] W[ise], Rural Route 1, Box 808, Kauffman Ave., Nielsen Reservation, Red Bluff, California 1945
Niess, William Victor, 2343 Hickory St., St. Louis 4, Missouri 1950
Nighswonger, Paul F., Rural Route 9, Alva, Oklahoma 1950
Nordgren, Robert, 79 Seymour Ave., S.E., Minneapolis 14, Minnesota 1951
Nordquist, Theodore C., 2701 York Ave., N., Robbinsdale 22, Minnesota 1941
Nork, Theodore J., 451 Wrightwood Ave., Chicago 14, Illinois 1947
Norman, Edward d'Aubigny, Box 221, Deerfield, Massachusetts 1951
Norman, James L[ee], 424 N. 12th, c/o Bebb Floral Co., Muskogee, Oklahoma 1948

Norris, Robert Allen, Museum of Vertebrate Zoology, University of California, Berkeley 4, California 1941
Norris, Russell T[aplin], 50 Milk St., Newburypost, Massachusetts 1939
Norse, William J[ohn], 531 W. 211th St., New York 34, New York 1939
North, George W[ebster], 33 Bold St., Hamilton, Ontario, Canada 1941
Northrop, Mrs. Horson A., 358 E. Main St., Owatonna, Minnesota 1952
Northrop, Myron, 7934 Delmar St., St. Louis 24, Missouri 1945
**Nowland, Paul J., 700 Equitable Bldg., Wilmington, Delaware 1950
Nyc, Fred F., Jr., P. O. Box 869, Brownsville, Texas 1943
Oberholser, Harry Church, 2933 Berkshire Road, Cleveland Heights, Cleveland, 18, Ohio 1894
O'Conner, Miss Esther [Laura], 4344 Locust Ave., Kansas City 4, Missouri 1940
Odum, Eugene P[leasants], Department of Zoology, University of Georgia, Athens, Georgia 1930
Odum, Howard Thomas, c/o Biology Department, University of Florida, Gainesville, Florida 1946
Oliver, Miss Mary C[lara], 411 W. Broadway, Silver City, New Mexico 1934
*Olsen, Dr. Richard E., 3325 Franklin Road, Rural Route 3, Pontiac, Michigan 1938
*Olson, Mrs. Gladys Elizabeth (Mrs. Simon), 33 Harvard Drive, Lake Worth, Florida 1942
Olson, Miss Hazel [Elizabeth], 832 E. State St., Jacksonville, Illinois 1951
Olson, Mrs. Monrad J., Box 145, Sanish, North Dakota 1946
Ommanney, G. G., c/o P. O. Box 14, Hudson Heights, Quebec, Canada 1944
O'Neil, Norah Selby (Mrs. Mike), 1311 Bonham St., Commerce, Texas 1949
*O'Reilly, Ralph A., Jr., Davisburg, Michigan 1936
Orians, Rev. Howard Lester, 1611 16th Ave., Monroe, Wisconsin 1947
*Ott, Frederick Louis, 2527 No. Wahl Ave., Milwaukee 11, Wisconsin 1941
Overing, Robert, Rural Route 4, Raleigh, North Carolina 1930
Owre, Oscar T., 2625 Newton Ave., So., Minneapolis 8, Minnesota 1935
Packard, Christopher M., 14 Belmont St., Brunswick, Maine 1951
Packard, Fred Mallory, 1840 Mintwood Pl., N. W., Washington 9, D. C. 1949
Paine, Robert T[reat], III, 2 Nubbard Park, Cambridge 38, Massachusetts 1951
Palmer, Ralph S[imon], New York State Museum, State Education Building, Albany 1, New York 1934
Palmer, T[heodore] S[herman], 1939 Biltmore St., N. W., Washington, D. C. 1914
*Palmquist, Clarence O[scar], 834 Windsor Road, Glenview, Illinois 1945
Pangborn, Mark W[hite], 25 E. 56th St., Indianapolis, Indiana 1948
Parker, Henry M[elville], Cochituate Road, Wahland, Massachusetts 1941
*Parkes, Kenneth Carroll, Lab. of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1946
Parks, G. Hapgood, 99 Warrenton Ave., Hartford 5, Connecticut 1950
Parks, Richard Anthony, 2303 Pembrook Pl., N. E., Atlanta, Georgia 1942
Parmelee, David F[reeland], 1465 University Terrace, Apt. 1326, Ann Arbor, Michigan 1949
Partch, Max L[orenzo], State Teachers College, St. Cloud, Minnesota 1940
Paul, Mrs. Harold Gilmore, Rural Route 1, Pickerington, Ohio 1948
Paulson, Clarence, Seneca, Wisconsin 1949
Paynter, R[aymond] A[ndrew], Jr., Kent Drive, Hamden, Connecticut 1946
Peelle, Miles L. 1039 College St., Adrian, Michigan 1940
Penner, Lawrence R., Department of Zoology & Entomology, University of Connecticut, Storrs, Connecticut 1940
Perkins, Mrs. Mary Loomis, 1305 S. 52nd St., Omaha 6, Nebraska 1946
*Perner, Miss Margaret E., 2487 Noble Road, Apt. 30-D, Cleveland Heights 21, Ohio 1943
Perry, William L[ouis], Falmouth Foreside, Portland, Maine 1949
Peterle, Tony J., Cusino Wildlife Research Station, Michigan Department of Conservation, Shingleton, Michigan 1951
Peters, Harold S[eymour], 968 Cumberland Road, N. E., Atlanta 6, Georgia 1924
Peters, Stuart S., 94 Carruthers Ave., Kingston, Ontario, Canada 1952
Petersen, Peter C., Jr., 620 E. 30th St., Davenport, Iowa 1952

Petersen, (Mrs.) Paula R., 620 E. 30th St., Davenport, Iowa 1951
Peterson, Alfred, Box 201, Brandt, South Dakota 1931
Peterson, Arnold J[erome], Biology Dept., Concordia College, Moorhead, Minnesota 1949
Peterson, Mrs. C[harles] E[mil], Madison, Minnesota 1936
Peterson, Randolph L., Div. of Mammals, Royal Ont. Museum of Zoology, Toronto, Ontario, Canada 1946
**Peterson, Roger Tory, P.O. Box 7, Glen Echo, Maryland 1942
Petrides, George A., Division of Conservation, Michigan State College, East Lansing, Michigan 1942
*Petroskey, Miss Helen Martha, Box 91, Hiram, Ohio 1949
**Pettingill, Olin Sewell, Jr., Dept. of Zoology, Carleton College, Northfield, Minnesota 1930
Pettit, Lincoln C[oles], Hiram, Ohio 1948
Peugh, Miss Marguerite M[ary], Apartado 16, Mantemorelos, N.L., Mexico 1951
**Phelps, William H[enry], Apartado 2009, Caracas, Venezuela, South America 1940
**Phillips, Allan Robert, 113 Olive Road, Tucson, Arizona 1934
*Phillips, Cyrus Eastman, II, 255 Polk St., Warsaw, Illinois 1944
*Phillips, Homer Wayne, Route 1, Box 81, Austin, Texas 1947
Phillips, Richard Stuart, 834 Liberty St., Findlay, Ohio 1944
Phillips, William B[utterworth], 137 W. 81st St., New York 24, New York 1951
Pierce, Fred J[ohn], Winthrop, Iowa 1947
Pierce, Robert Allen, Nashua, Iowa 1941
Pirnie, Miles David, Conservation Bldg., Michigan State College, East Lansing, Michigan 1928
*Pittman, James Allen, Jr., 1138 Overbrook Dr., Orlando, Florida 1945
Plaisted, Walter William, 95 Newcomb Road, Tenafly, New Jersey 1949
Plath, Karl, 305 S. Cuyler Ave., Oak Park, Illinois 1942
Pomeroy, Lawrence R., New Jersey Oyster Research Lab., Bivalve, New Jersey 1948
*Poole, Cecil A[very], 1764 Topeka Ave., San Jose 26, California 1942
Poor, Hustace Hubbard, 230 E. 71st St., New York 21, New York 1935
*Porter, Dr. Eliot F[urness], Route 1, Box 33, Sante Fe, New Mexico 1947
Porter, Richard Dee, 3130 Ogden Ave., Ogden, Utah 1950
Porter, T[homas] Wayne, Dept. of Zoology, Michigan State College, East Lansing, Michigan 1938
Potter, David M., 1557 Timothy Dwight College, Yale Univ., New Haven 11, Connecticut 1946
*Potter, Mrs. George C. (Beatrice B[rown]), 2111 Malvern Road, Charlotte 7, North Carolina 1948
Potter, Julian K[ent], 437 Park Ave., Collingswood 7, New Jersey 1915
Potter, Louis Henry, Route 1, West Rutland, Vermont 1941
**Pough, Richard H[ooper], 33 Highbrook Ave., Pelham 65, New York 1938
Prather, Millard F[illmore], 1129 Brown-Marx Building, Birmingham 3, Alabama 1940
Prescott, Kenneth Wade, U.S. Naval Prep. School, U.S.N.T.C., Bainbridge, Maryland 1946
Preston, Miss Elsie M[ary], 624 Brickell Ave., Miami, Florida 1952
Preston, Frank W[illiam], Box 149, Butler, Pennsylvania 1948
Prucha, Miss Alma H., 1716 N. Prospect Ave., Milwaukee 2, Wisconsin 1942
Pruitt, Ben H., Route 2, Box 33, Springfield, Oregon 1951
Pruitt, Mrs. William O., Jr. (Erna Nauert), Museum of Zoology, Ann Arbor, Michigan 1948
Puett, Miss May Wilson, P.O. Box 2183, Greenville, South Carolina 1950
Purvis, Miss Betty, Route 1, Renfrew (Butler County), Pennsylvania 1952
Putman, William L[loyd], Dominion Entomological Lab., Vineland Sta., Ontario, Canada 1945
Putnam, Mrs. Edward K., 2123 W. Pleasant St., Davenport, Iowa 1951
Putnam, Mrs. Evelyn J., 1531 Jefferson St., Duluth, Minnesota 1951
Putnam, Loren Smith, Dept. of Zoology, Ohio State Univ., Columbus 10, Ohio 1942
Quam, Mrs. Mary Battell, Box 716, Paoli, Pennsylvania 1944

Quay, Thomas L., Zoology Dept., North Carolina State College, Raleigh, North Carolina 1939
Quay, W[ilbur] B[rooks], Museum of Zoology, Univ. of Michigan, Ann Arbor, Michigan 1949
Quimby, Don C., Dept. of Zoology & Entomology, Montana State College, Bozeman, Montana 1942
Racey, Kenneth, 6542 Lime St., Vancouver, British Columbia, Canada 1951
Ragusin, Anthony V[incent], P.O. Box 496, Biloxi, Mississippi 1937
Rahe, Carl W., 9005 Tioga Ave., Cleveland 5, Ohio 1931
Ramisch, Miss Marjorie [Viola], 1835 Noble Rd., East Cleveland 12, Ohio 1943
Ramey, Ralph E[merson], Jr., 1140 W. Ashby Pl., San Antonio, Texas 1948
Ramsay, A[lfred] Ogden, McDonogh School, McDonogh, Maryland 1949
Rand, Austin L., Chicago Natural History Museum, Roosevelt Rd. & Lake Shore Dr., Chicago 5, Illinois 1950
*Randall, Clarence B[elden], 38 S. Dearborn St., Chicago, Illinois 1949
Randall, Robert Neal, 928 16th St., Bismarck, North Dakota 1939
Randle, Worth S., 3622 Zumstein Ave., Cincinnati 8, Ohio 1949
Rapp, William F[rederick], Jr., 2759 "F" St., Lincoln, Nebraska 1941
*Rausch, Dr. Robert [Lloyd], U.S. Public Health Service, Box 960, Anchorage, Alaska 1947
Rawlings, William Herbert, 341 Graham Blvd., Apt. 1, Mt. Royal, Montreal 16, Quebec, Canada 1952
Rawson, George William, Ciba Pharmaceutical Products, Inc., Lafayette Park, Summit, New Jersey 1947
Rea, Gene, 251 Leland Ave., Columbus 2, Ohio 1948
Read, Bayard W[hitney], Upper Dogwood Lane, Rye, New York 1949
*Rebmann, G. Ruhland, Jr., 729 Millbrook Lane, Haverford, Pennsylvania 1941
Reed, Parker Crosby, 27 Hayes Ave., Lexington, Massachusetts 1949
Reeder, Miss Clara Maude, 1608 College Ave., Houghton, Michigan 1938
Rees, Earl Douglas, 1504 No. Main St., Findlay, Ohio 1946
Reese, C[arl] R[ichard], 266 E. Dunedin Rd., Columbus 14, Ohio 1948
*Reese, Mrs. Hans H. (Teresa S.), 3421 Circle Close, Shorewood Hills, Madison 5, Wisconsin 1941
Reeve, Alexander Jardine, 276 Renfrew St., Winnipeg, Manitoba, Canada 1950
Regan, Mrs. Frances M[aass], 113-19 Colfax St., Queen Village, New York 1948
*Rehfisch, Miss Carol, 335 Delgado, Santa Fe, New Mexico 1949
*Reichert, Miss Elsa, c/o Mirakel Repair Co., 14 W. 1st St., Mt. Vernon, New York 1950
Reilly, E[dgar] M[ilton], Jr., P.O. Box 34, Old Chatham, New York 1946
Renn, Miss Elmira Virginia, 3949 "R" St., S.E., Washington 20, D.C. 1949
Rett, Egmont Z[achary], Museum of Natural History, Santa Barbara, California 1940
Reuss, Alfred Henry, 2908 Edison St., Blue Island, Illinois 1936
Reynard, George B., 728 Parry Ave., Palmyra, New Jersey 1950
Reynolds, Mrs. Perry J., 5293 Bedford St., Detroit 24, Michigan 1948
Reynolds, William Pius, 1330 Foulkrod St., Philadelphia 24, Pennsylvania 1948
Rice, Dale [Warren], 432 W. 42nd St., Indianapolis 8, Indiana 1946
Rich, Mrs. Eva, 150 W. 80th St., New York 24, New York 1952
Richards, Tudor, St. Paul's School, Concord, New Hampshire 1951
Richdale, Lancelot Eric, 23 Skibo St., Kew, Dunedin, S.W. 1, New Zealand 1945
Richter, Carl H., 703 Main St., Oconto, Wisconsin 1947
Ricker, W[illiam] E[dwin], Pacific Biological Sta., Nanaimo, British Columbia, Canada 1943
Riggs, Carl D[aniel], Dept. of Zoology, Univ. of Oklahoma, Norman, Oklahoma 1943
Riggs, Miss Jennie, 3313 Fairmont Dr., Nashville 5, Tennessee 1952
Rimsky-Korsakoff, V[ladimir] N[icholas], Box 735, Center Moriches, Long Island, New York 1951
Ripley, S[idney] Dillon, II, Peabody Museum, New Haven 2, Connecticut 1946
Risebrough, Robert W., 1732 Kline Rd., Ithaca, New York 1952
*Ritchie, Dr. Robert C., 165 Alexandra Blvd., Toronto 12, Ontario, Canada 1942
Ritzer, Henry John, 148 Kensington Ave., Jersey City 4, New Jersey 1951

**Robbins, Chandler S[eymour], Patuxent Research Refuge, Laurel, Maryland 1941
**Robbins, Eleanor C[ooley] (Mrs. Chandler S.), Patuxent Research Refuge, Laurel, Maryland 1936
Roberts, Harold D., 610 Harrison St., Black River Falls, Wisconsin 1946
Robins, C[harles] Richard, Dept. of Conservation, Fernow Hall, Cornell Univ., Ithaca, New York 1949
Robinson, Thane S., Museum of Natural History, Univ. of Kansas, Lawrence, Kansas 1952
Roesler, Mrs. Carol S. (Mrs. M. Stuart), June Road, Cos Cob, Connecticut 1949
Roesler, M. Stuart, June Road, Cos Cob, Connecticut 1949
**Rogers, C[harles] H[enry], East Guyot Hall, Princeton, New Jersey 1903
Rogers, K[ay] T[rowbridge], Dept. of Anatomy, E. Med. Bldg., Univ. of Michigan, Ann Arbor, Michigan 1952
**Rogers, Miss Mabel T., 436 No. Beach St., W., Daytona Beach, Florida 1947
Rogers, Mrs. Walter E., 911 E. North St., Appleton, Wisconsin 1931
Rooney, James P., 1514 So. 12th Ave., Yakima, Washington 1947
**Root, Oscar M[itchell], Brooks School, North Andover, Massachusetts 1940
Roppel, Otto, (16) Marburg-Lahn Wettergasse 39, Western Germany, U.S. Zone 1952
Rorimer, Mrs. J. M. (Irene Tuck), 3624 Prospect Ave., N.W., Washington 7, D.C. 1938
*Rose, W[illiam] C[umming], 710 W. Florida Ave., Urbana, Illinois 1949
Rosene, Walter, Jr., P. O. Box 665, Gadsden, Alabama 1942
Rosewall, O[scar] W[aldemar], Dept. of Zoology, Louisiana State Univ., Baton Rouge 3, Louisiana 1931
*Ross, C[harles] Chandler, 7924 Lincoln Dr., Chestnut Hills, Philadelphia 18, Pennsylvania 1937
Ross, James B., 225 Oldfield Road, Decatur, Georgia 1949
*Routa, Albert, 331½ E. Main St., Clarksburg, West Virginia 1950
**Rudd, Dr. Clayton G[lass], 315 Medical Arts Bldg., Minneapolis 2, Minnesota 1944
Rudolph, Mrs. Ross, Route 1, Downsview, Ontario, Canada 1952
Ruhr, C[lifford] E[ugene], 1007 Laurel St., Atlantic, Iowa 1947
Russak, Marshall L., 1675 Metropolitan Ave., New York 62, New York 1952
Russell, Stephen M[ims], Box 5456, Virginia Tech. Sta., Blacksburg, Virginia 1952
Rustad, Orwin A., Dept. of Biology, St. Olaf College, Northfield, Minnesota 1951
Rutter, Russell James, Huntsville, Ontario, Canada 1950
Ryan, Richard, 5009 Broadway, New York 34, New York 1949
Rycraft, Thomas M[atten], 427 E. Third St., Watsonville, California 1952
Ryder, Ronald A. (Ensign USNR), USS ALGOL (AKA 54), FPO San Francisco, California 1952
Ryel, Lawrence [Atwell], 3401 Benstein Road, Milford, Michigan 1951
Sabin, Walton B., Route 2, Altamont, New York 1945
Sait, Carroll C[harles], 4134 Old Orchard Ave., Montreal 28, Quebec, Canada 1949
Samson, Dale D[umont], 613 Carrolton Blvd., West Lafayette, Indiana 1951
Sanborn, Alvah W., Pleasant Valley Sanctuary, Lenox, Massachusetts 1951
Sandy, Miss Tirzah M., University Hospital, Redwood & Greene Sts., Baltimore 1, Maryland 1950
Satterly, J[ack], 100 Castlewood Road, Toronto 12, Ontario, Canada 1947
Satterthwait, Mrs. Elizabeth Allen (Mrs. A. F.), 775 19th Ave., So., St. Petersburg, Florida 1925
Sauer, Dr. Gordon C[henoweth], 2620 Francis St., St. Joseph, Missouri 1949
Saugstad, N[els] Stanley, Route 4, Minot, North Dakota 1939
Saunders, Aretas A[ndrews], Box 141, Canaan, Connecticut 1934
Saunders, George B[radford], Patuxent Research Refuge, Laurel, Maryland 1926
**Savage, James Buffalo Athletic Club, Buffalo, New York 1939
Sawyer, Miss Dorothy, 323 Division St., Schenectady 4, New York 1937
Schaeffer, Ens. David A[lan], U.S.N., U.S.S. LSM 268, c/o Fleet P.O., San Francisco, California 1949
Schaich, Charles A., 1301 Walnut St., Reading, Pennsylvania 1951
Scharff, Abe, 196 E. Parkway, S., Memphis 4, Tennessee 1952
Schley, Mrs. Sue S. (Mrs. F. B.), 1352 Peacock Ave., Columbus, Georgia 1952
Schlonga, A[ndrew] M[atthews], 511 Thornton St., Leavenworth, Kansas 1952

Schneider, Miss Evelyn J., 2207 Alta Ave., Louisville 5, Kentucky 1935
Schoenbauer, Miss Clara K., 5319 Greenway Drive, Hyattsville, Maryland 1952
Scholes, Mrs. Doris Kathryn, 385 E. Hall St., Bushnell, Illinois 1947
**Schorger, A[rlie] W[illiam], 168 N. Prospect Ave., Madison, Wisconsin 1927
*Schramm, Wilson [Cresap], 321 Kensington Road, Syracuse 10, New York 1944
Schreiner, Keith M., Capital Bldg., State Game & Fish Dept., Bismarck, North Dakota 1949
Schultz, Mrs. Robert (Zella McMannama), 22809 W. 53rd Ave., Edmonds, Washington 1950
Schumm, William George, 302 "C" St., LaPorte, Indiana 1944
Schwartz, Charles Walsh, 131 Forest Hill, Jefferson City, Missouri 1950
Schwartz, Paul, Apartado 1766, Caracas, Venezuela 1952
Schwendener, Mrs. Carl M., 1722 N. 48th St., Milwaukee 8, Wisconsin 1949
Schwilling, Marvin D., Box 864, Garden City, Kansas 1951
Sciple, George W., Wildlife Research Lab., Bldg. 45, Denver Federal Center, Denver 2, Colorado 1951
Scotland, Miss Minnie B[rink], 42 Continental Ave., Cohoes, New York 1938
Scott, D. M., Dept. of Zoology, Univ. College, Univ. of Western Ontario, London, Ontario, Canada 1950
*Scott, Frederic R[obert], 2700 Malvern Ave., Apt. 2, Richmond 21, Virginia 1947
Scott, Fred T., Pittsburg, New Hampshire 1948
Scott, Peter, The New Grounds, Slimbridge, Gloucestershire, England 1947
Scott, Robert R., III, 4253 Kingston Pike, Knoxville, Tennessee 1952
Scott, Thomas G[eorge], Section of Game Research & Mgmt., Illinois Natural History Survey, Urbana, Illinois 1936
Scott, W[alter] E[dwin], 1721 Hickory Drive, Madison 5, Wisconsin 1938
Sealander, John A[rthur], Jr., Dept. of Zoology, Univ. of Arkansas, Fayetteville, Arkansas 1947
Seaman, George Albert, P.O. Box 344, St. Thomas, Virgin Islands 1950
Searles, Scott, Dept. of Chemistry, Kansas State College, Manhattan, Kansas 1951
Seeber, Edward L[incoln], 1654 Fifth Ave., Huntington 3, West Virginia 1944
Seibert, Henri C., Ohio University, Athens, Ohio 1941
Seiple, Stanley, Grove City College, Grove City, Pennsylvania 1951
Serbousek, Miss Lillian, 1226 Second St., S.W., Cedar Rapids, Iowa 1935
*Shackleton, Mrs. Elizabeth C[atterall] (Mrs. Walter H.), Route 1, Box 76-A, Prospect, Kentucky 1947
*Shackleton, Walter H., Route 1, Box 76-A, Prospect, Kentucky 1947
Shaftesbury, Archie D., Women's College, Univ. of North Carolina, Greensboro, North Carolina 4 1930
Shannon, Bernice [Irene] B[eladeau] (Mrs. Francis P.), 3021 Eagle Pass, Louisville 13, Kentucky 1949
Sharp, Henry S[taats], 180 Ames Ave., Leonia, New Jersey 1951
Sharp, Ward M., 206 Forestry Bldg., Pennsylvania State College, State College, Pennsylvania 1936
Sharpless, Mrs. Isaac, 1235 Wendover Road, Rosemont, Pennsylvania 1952
Shaub, Benjamin Martin, 159 Elm St., Northampton, Massachusetts 1948
Shaver, Jesse M[ilton], George Peabody College for Teachers, Nashville, Tennessee 1922
Shaw, Dr. Charles H[icks], Bremen, Ohio 1941
*Shearer, A[mon] R[obert], Box 428, Mont Belvieu, Chambers County, Texas 1893
Sheehan, Robert R[aymond], Navy 3080 Box 20, FPO San Francisco, California 1952
Shelford, Victor E[rnest], Vivarium Bldg., Univ. of Illinois, Champaign, Illinois 1931
Shetler, Stanwyn G[erald], Route 2, Hollsopple, Pennsylvania 1949
*Shires, James E., AF 35741450, 67th Recon. Tech. Sq., APO 970, PM San Francisco, California 1951
Short, Wayne, 1030 Fifth Ave., New York 28, New York 1941
Sibley, Charles G[ald], Dept. of Natural Sciences, San Jose State College, San Jose 14, California 1942
Sick, Helmut, Av. Nilo Pecanha 23, III, Rio de Janeiro, D.F., Brazil 1951
Sieh, James G[erald], Biology Bldg., Okoboji, Iowa 1948

*Simmons, Mrs. Amelia C., 2742 N. Maryland Ave., Milwaukee 11, Wisconsin 1943
**Simmons, Edward McIlhenny, Avery Island, Louisiana 1942
**Simmons, Grant Gilbert, Jr., Lake Ave., Greenwich, Connecticut 1949
Simon, James R., Jackson Hole Wildlife Park, Moran, Wyoming 1947
Simon, Stephen Wistar, 7727 York Road, Towson, Baltimore 4, Maryland 1947
Simpson, Mrs. Roxie Collie, 6624 First St., N.W., Washington 12, D.C. 1949
Sims, Harold L[ee], 714 St. Philip St., Thibodaux, Louisiana 1942
Singleton, Albert Roland, 3968 Marburg Ave., Cincinnati 9, Ohio 1948
Siverling, (Mrs.) Signa J., Bowbells, North Dakota 1952
Sjodahl, Sven Erik, 7013 Noble Ave., Cincinnati 24, Ohio 1949
Skaggs, Merit B[ryan], Eagle & Dodd Roads, Route 1, Willoughby, Ohio 1934
Skelton, Mrs. Kathleen, 353 W. 57th St., New York, New York 1949
Skutch, Alexander F[rank], San Isidro del General, Costa Rica, Central America 1944
Slack, Miss Mabel, 1004 Everett Ave., Louisville 4, Kentucky 1934
Smalley, Alfred E[vans], 1117 E. Cumberland Ave., Middlesboro, Kentucky 1946
Smart, Robert W[illiam], Dunbar Hall, Exeter, New Hampshire 1951
*Smith, Allen G[ordon], Box 603, Brigham City, Utah 1949
*Smith, Dr. A[rthur] F[rancis], Manning, Iowa 1934
Smith, Carl E[rnest], Halsey, Nebraska 1947
Smith, Earl E[mmett], Atkins Garden & Research Lab., Apartado 414, Saledad, Cienfuegas, Cuba 1947
*Smith, Miss Emily, Route 1, Box 387, Los Gatos, California 1948
Smith, Frank R[ush], Route 2, Box 93, Laurel, Maryland 1910
Smith, Harry M[adison], Dept. of Zoology & Physiology, Univ. of Wyoming, Laramie, Wyoming 1936
Smith, Miss Marion L[ucille], 429 S. Willard St., Burlington, Vermont 1949
Smith, Orion O., Box 150–A, Spring Creek Road, Rockford, Illinois 1936
Smith, R[obert] D[emett], 1141 Minna Place, Memphis 5, Tennessee 1951
Smith, Robert L[eo], Route 1, Reynoldsville, Pennsylvania 1945
Smith, Robert Skalak, 12904 Melgrove Ave., Garfield Heights, Ohio 1950
*Smith, Roy Harmon, 183 No. Prospect St., Kent, Ohio 1936
Smith, Thomas Price, W-5 Green Tree Manor, Louisville 7, Kentucky 1951
Smith, Wendell Phillips,, Wells River, Vermont 1921
Smith, Mrs. Winnifred Wahls (Mrs. E. R.), Winghaven, Route 1, Two Rivers, Wisconsin 1946
Snapp, Mrs. R. R., 310 W. Michigan, Urbana, Illinois 1940
Snow, Mrs. C. S. (Mabelle), 2211 Chester Blvd., Richmond, Indiana 1950
Snyder, Dana Paul, Section of Mammals, Carnegie Museum, Pittsburgh 13, Pennsylvania 1949
*Snyder, Dorothy E[astman], 452 Lafayette St., Salem, Massachusetts 1951
Snyder, L[ester] L[ynne], Royal Ontario Museum of Zoology, Queen's Park at Bloor, Toronto, Ontario, Canada 1929
Sooter, Clarence Andrew, U.S. Public Health Service, P.O. Box 1132, Greeley, Colorado 1940
**Sorrill, Mrs. Anna Marie (Mrs. Tom), Tom Sorrill Farm, Ursa, Illinois 1950
Sowls, Lyle K[enneth], Arizona Coop. Wildlife Research Unit, Univ. of Arizona, Tucson, Arizona 1949
Spangler, Miss Iva M., 128 E. Foster Pkwy., Fort Wayne, Indiana 1939
Sparkes, Miss Vera E., 2417 Lyndale Ave., No., Minneapolis 11, Minnesota 1951
Speirs, Mrs. Doris Huestis, "Cobble Hill", Route 2, Pickering, Ontario, Canada 1936
Speirs, J[ohn] Murray, "Cobble Hill", Route 2, Pickering, Ontario, Canada 1931
**Spencer, Haven Hadley, 3412 Oakwood, Ann Arbor, Michigan 1946
**Spencer, Miss O[live] Ruth, 1030 25th Ave. Court, Moline, Illinois 1938
Sperry, Charles Carlisle, 1455 S. Franklin St., Denver 10, Colorado 1931
Spofford, Walter R[ichardson], II, Dept. of Anatomy, Syracuse Medical College, Syracuse 10, New York 1942
Springer, Paul F[rederick], Patuxent Research Refuge, Laurel, Maryland 1946
Sprunt, Alexander, Jr., The Crescent, Charleston 50, South Carolina 1951
Stabler, Mrs. Jeanne J[ohnson], c/o L. J. Stabler, Rogers Lane, Wallingford, Pennsylvania 1952

Stabler, Robert M[iller], Colorado College, Colorado Springs, Colorado 1939
Staebler, Arthur E[ugene], W. K. Kellogg Bird Sanctuary, Route 1, Augusta, Michigan 1937
*Stahl, Miss Marjoretta Jean, Kimberly, West Virginia 1942
Stallcup, William B., Museum of Natural History, Univ. of Kansas, Lawrence, Kansas 1951
Stamm, Mrs. Frederick W. (Anne L.), 2118 Lakeside Dr., Louisville 5, Kentucky 1947
Stark, Miss Wilma R[uth], 2108 16th St., N.W. 3, Washington, D.C. 1939
Starrett, William C[harles], Illinois State Natural History Survey, Route 2, Havana, Illinois 1933
Stauffer, James Milton, Haugen, Wisconsin 1949
Stauffer, Ralph Stanley, 170 W. Washington St., Hagerstown, Maryland 1949
Stavrum, Thomas J., 30 N. Spooner St., Madison 5, Wisconsin 1951
Stearns, Edwin I[ra], Jr., 928 Grant Ave., Plainfield, New Jersey 1945
Steel, William C., 551 Morningside Dr., Miami Springs, Florida 1952
Steffen, Earnest William, 1000 Maplewood Drive, Cedar Rapids, Iowa 1944
Steilberg, Robert H., 555 Sunset Rd., Louisville 6, Kentucky 1949
Stein, Robert C., Lab. of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1951
Stettenheim, Peter, Reading, Vermont 1951
Stevens, Charles E[lmo], Jr., 426 Second St., N.E., Charlottesville, Virginia 1947
Stevens, O. A., State College Station, Fargo, North Dakota 1926
Stevenson, Henry M[iller], Jr., Dept. of Zoology, Florida State Univ., Tallahassee, Florida 1943
Stevenson, James O[sborne], Fish & Wildlife Service, Washington 25, D.C. 1933
Steward, Orville M[ilton], P.O. Box 19, Fordham Branch, Bronx 58, New York 1950
*Stewart, Miss Mildred, 2219 Devonshire Dr., Cleveland 6, Ohio 1949
Stewart, Paul A[lva], 8640 No. State St., Westerville, Ohio 1925
*Stewart, Robert Earl, Patuxent Research Refuge, Laurel, Maryland 1939
Stillwell, Jerry E., Route 2, Fayetteville, Arkansas 1935
Stillwell, Wendell W[arden], 406 E. Vine St., Mt. Vernon, Ohio 1951
*Stine, Miss Perna M., Route 5, Olney, Illinois 1931
Stitt, Merle E., Box 233, McCall, Idaho 1950
**Stoddard, Herbert Lee, Sherwood Plantation, Route 5, Thomasville, Georgia 1916
Stoerman, Frank A., 1721½ Westport Road, Kansas City 2, Missouri 1952
Stokes, Allen W., Dept. of Wildlife Mgmt., U.S.A.C., Logan, Utah 1950
Stoner, Emerson Austin, 285 E. "L" St., Box 444, Benicia, California 1947
**Stoner, Mrs. Lillian C. (Mrs. Dayton), 399 State St., Albany 6, New York 1945
Stophlet, John J[ermain], 2612 Maplewood Ave., Toledo 10, Ohio 1934
Storer, Robert Winthrop, Museum of Zoology, Univ. of Michigan, Ann Arbor, Michigan 1938
*Storer, Dr. Tracy I[rwin], Div. of Zoology, Univ. of California, Davis, California 1928
Stout, Paul, 2041 24th Ave., South, Nashville, Tennessee 1951
Straw, Richard M[yron], 338 W. 6th St., Claremont, California 1947
Strecker, Robert L[ouis], Zoology Dept., Miami Univ., Oxford, Ohio 1949
Street, Phillips B[orden], Exton, Pennsylvania 1946
Street, Thomas M., State Dept. of Health, Bureau of Vector Control, 2180 Milvia St., Berkeley 4, California 1940
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Stringer, Kirby [Odell], P.O. Box 772, Memphis 1, Tennessee 1950
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Struthers, Dana R., 4858 Fremont Ave., S., Minneapolis 9, Minnesota 1948
Stull, W[illiam] D[eMott], Route 1, Delaware, Ohio 1952
Stupart, Miss Barbara, 48 Russell Hill Road, Toronto, Ontario, Canada 1952
Stupka, Arthur, Great Smoky Mts. Nat. Park, Gatlinburg, Tennessee 1935
**Sturgeon, Myron T., Dept. of Geography & Geology, Ohio Univ., Athens, Ohio 1934
Sturm, [William] Louis, S.O.M. Center Road, Solon, Ohio 1943
Summerfield, Donald, Route 2, Box 4, Valley Station, Kentucky 1952
Sundell, Robert A[rnold], 94 Main St., Frewsburg, New York 1951

Suthard, James G[regory], 1881 Raymond Ave., Long Beach 6, California 1936
Sutherland, Mrs. Robert L., 1513 Gaston Ave., Austin 21, Texas 1950
Suttkus, Royal Dallas, Zoology Dept., Dinwiddie Hall, Tulane Univ., New Orleans 18, Louisiana 1947
**Sutton, George Miksch, Dept. of Zoology, Univ. of Okla., Norman, Oklahoma 1920
Svärdson, Doc. Gunnar, Odmärdsvägen 17, Traneberg, Sweden 1949
Swanson, Gustav A., Fernow Hall, Cornell Univ., Ithaca, New York 1927
Swedenborg, Ernie D[avid], 4905 Vincent Ave., S., Minneapolis 10, Minnesota 1929
Sweet, William O., 175 Park St., Attleboro, Massachusetts 1949
Switzer, Mrs. Ann Harney, 1620 Fairidge Place, Kingsport, Tennessee 1952
*Taber, Wendell, 3 Mercer Circle, Cambridge, Massachusetts 1936
Tabler, Mrs. William B. (Fan Boswell), 2923 Riedling Dr., Louisville 6, Kentucky 1947
Tabor, Miss Ava Rogers, 305 Canal Blvd., Thibodaux, Louisiana 1940
Taintor, Mrs. Elizabeth Tabor, 11 Story St., Cambridge 38, Massachusetts 1945
Tallman, William S[weet], Jr., No. 4 Linden Pl., Sewickley, Pennsylvania 1940
Tanghe, Leo J[oseph], 852 Stone Rd., Rochester 16, New York 1943
Tanner, James Taylor, Dept. of Zoology, University of Tennessee, Knoxville 16, Tennessee 1937
*Tashian, Richard E[arl], Biology Dept., Long Island Univ., 380 Pearl St., Brooklyn 1, New York 1949
**Taylor, Arthur Chandler, 309 N. Drew St., Appleton, Wisconsin 1929
Taylor, H[erbert] S[tanton], 1369 Fair Ave., Columbus 5, Ohio 1948
Taylor, Nelson, May's Lake, Route 4, Stillwater, Minnesota 1951
Taylor, Dr. R[obert] L[incoln], 810 Highland Dr., Flintridge, Pasadena 3, California 1947
Taylor, Mrs. Walker L[ewis], c/o Mrs. G. D. Phelps, Towner Park Road, Sidney, Vancouver Island, British Columbia 1952
Teachenor, Dix, 1020 W. 61st St., Kansas City, Missouri 1923
Teale, Edwin Way, 93 Park Ave., Baldwin, Long Island, New York 1948
Tenney, Albert R., Route 1, Box 101, Toronto, Ohio 1949
Terrill, Lewis McIver, 216 Redfern Ave., Westmount, Montreal 6, Quebec, Canada 1948
Thacher, S. Charles, 2918 Brownsboro Road, Louisville 6, Kentucky 1942
Thomas, Edward S[inclair], Ohio State Museum, Columbus 10, Ohio 1921
Thomas, Landon B[aillie], P.O. Box 141, Edgerton, Wisconsin 1947
Thomas, Brother Leo, F.S.C., Christian Brothers College, 650 E. Parkway, South Memphis 4, Tennessee 1952
Thomas, Mrs. Rowland (Ruth H.), 410 E. Green St., Morrillton, Arkansas 1937
Thompson, Daniel Q., Wildlife Research Unit, Univ. of Missouri, Columbia, Missouri 1945
Thompson, Donald R[uff], 4313 Shore Acres Rd., Madison 4, Wisconsin 1947
Thompson, Milton D., 1317 W. Glenn St., Springfield, Illinois 1952
Thompson, William Lay, 2204 Bowman Ave., Austin, Texas 1952
*Thorley, Robert F., 3 Midland Gardens, Bronxville 8, New York 1946
Thornburg, Ashley Alvin, 306 Hot Wells Blvd., San Antonio 10, Texas 1950
**Thorne, Oakleigh, II, Box 347, Islip, Long Island, New York 1947
*Thornton, Wilmot A[rnold], Dept. of Zoology, Univ. of Texas, Austin, Texas 1948
**Thorp, George B[oulton], 556 Abbott Ave., Ridgefield, New Jersey 1935
Thorsell, Richard S., 7 House Road, Morristown, New Jersey 1951
Thorson, Thomas B[ertel], Div. of Natural Sciences, San Francisco State College, San Francisco 2, California 1949
Throne, Alvin L., Wisconsin State College, Milwaukee 11, Wisconsin 1949
Tinbergen, N[ikolass], Dept. of Zoology, University Museum, Oxford, England 1947
Tipton, Dr. Samuel R[idley], 1415 W. Adair Dr., Fountain City, Knoxville 18, Tennessee 1941
*Todd, Mrs. Elizabeth D. (Mrs. Paul H.), 918 W. Main St., Kalamazoo 48, Michigan 1939
Todd, George K[endall], 809 W. 25th St., Cheyenne, Wyoming 1943
*Todd, Henry O[liver], Jr., Woodberry Road, Murfreesboro, Tennessee 1938
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Todd, W[alter] E[dmond] Clyde, Carnegie Museum, Pittsburgh 13, Pennsylvania 1911
Tomich, P[rosper] Quentin, 204 Dororo Drive, Salinas, California 1948
*Tomkins, Ivan Rexford, 1231 E. 50th St., Savannah, Georgia 1931
Tordoff, Harrison B[ruce], Museum of Natural History, Univ. of Kansas, Lawrence, Kansas 1947
*Townsend, Miss Elsie White, Dept. of Biology, Wayne Univ., 4841 Cass Ave., Detroit 1, Michigan 1938
Trainer, John E[zra], Dept. of Biol., Muhlenberg College, Allentown, Pennsylvania 1952
**Trautman, Milton B[ernhard], Stone Laboratory, Put-in-Bay, Ohio 1932
*Traylor, Melvin Alvah, Jr., 759 Burr Ave., Winnetka, Illinois 1947
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**Tucker, Mrs. Carll, Penwood, Mount Kisco, New York 1928
Tucker, Donald [Julius], 103 N. Ballston Ave., Scotia, New York 1952
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Tyrrell, W. Bryant, 246 Park Ave., Takoma Park 12, Maryland 1947
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Vanek, Mrs. Charles W., 7441 Reuter Ave., Dearborn 1, Michigan 1952
**Van Tyne, Josselyn, Museum of Zoology, Univ. of Mich., Ann Arbor, Michigan 1922
Vasconcelos, Lic José, Plaza de la Ciudadela 6, Mexico City, D.F., Mexico 1952
**Vaughan, William C[oleman], Locust Grove Farm, River Road, Youngstown, New York 1941
Vaurie, Charles, American Museum of Natural History, 79th & Central Park, West, New York, New York 1946
Vincent, Brother Ignatius, F.S.C., St. Mary's College, Winona, Minnesota 1949
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Vore, Marvin E[lmer], 1128 No. 8th Ave., West Bend, Wisconsin 1947
Wade, Douglas E., Department of Entomology & Zoology, Clemson Agricultural College, Clemson, South Carolina 1936
Wade, Mrs. Sydney J. (Mrs. Katherine White), Rural Route 5, Box 229-A, Jefferson City, Missouri 1940
Wagner, Mrs. C. R. (Nancy Elizabeth), South Lane Farm, Utica, Ohio 1947
Wagner, Esther E., 22 Golden Hill, Bethel, Connecticut 1937
Wagner, Helmuth O., Bremer Ubersee Museum, Bremen, Germany 1945

Walker, Charles F[rederic], Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1939
Walker, David W[illiam], ETSN 3039438 — USS Roanoke — T Division, c/o Fleet P.O., New York, New York 1952
*Walker, Jason A[lison], 89 Church St., Box 295, Waterloo, New York 1949
Walker, M[yrl] V[incent], Zion National Park, Springdale, Utah 1943
**Walkinshaw, Dr. Lawrence Harvey, 1703 Central Tower, Battle Creek, Michigan 1928
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Wallner, Dr. Alfred, Box 120, Bakersfield, California 1941
Walters, Miss Kathleen, 312 Crane St., Royal Oak, Michigan 1944
Wandell, Willet N[orbert], Natural History Survey, Urbana, Illinois 1944
Wanless, Harold R[ollin], 704 S. McCullough St., Urbana, Illinois 1940
Ward, Loren D., 29 Maple St., Geneva, New York 1952
Warner, Dwain Willard, Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota 1946
Warters, Miss Mary Ellen, 5115 Woodland Ave., Des Moines 12, Iowa 1950
Wasson, Mrs. Theron, 606 Thatcher Ave., River Forest, Illinois 1951
Waterman, Ralph T[en Eyck], 13 Meadow Road, Poughkeepsie, New York 1947
*Watkins, Dr. John O[verby], 359 Pine St., Spartanburg, South Carolina 1952
Watson, Frank Graham, 4110 Drummond St., Houston 25, Texas 1937
Watson, James Dewey, Jr., Rural Route 2, Box 258, Chesterton, Indiana 1945
Watson, Robert J[ames], Box 75, Blacksburg, Virginia 1943
Watt, Mrs. Leafie Baldwin, Route 2, Rowe Place, Franklin, New Jersey 1952
Wayland-Smith, Robert, 137 Kenwood Ave., Oneida, New York 1952
Weaver, Mrs. Alice Helen Brown, 1434 Crain St., Evanston, Illinois 1948
Webster, Clark G[ibbons], Patuxent Research Refuge, Laurel, Maryland 1948
*Webster, J[ackson] Dan, Hanover College, Hanover, Indiana 1939
Weise, Charles M[artin], Vivarium Bldg., Univ. of Illinois, Urbana, Illinois 1949
Weiser, Virgil Leonard, 538 W. Villard, Dickinson, North Dakota 1946
Weller, Milton Webster, Wildlife Conservation Building, University of Missouri, Columbia, Missouri 1950
Welles, Mrs. George M. (Mary Pike), Rural Route 1, Elmira, New York 1938
Wellman, Mrs. Cora B[yard], Lincoln, Massachusetts 1951
Welty, Carl, Rural Route 1, Beloit, Wisconsin 1948
*Wernicke, Mrs. J[ulius] F. (Maleta Moore), Gull Point, Escambia County, Florida 1944
West, Mrs. E. M. (Adele H.), 803 Clayton Ave., Chattanooga 4, Tennessee 1950
Weston, Henry G[riggs], Jr., Grinnell College, Grinnell, Iowa 1947
Westphol, Mrs. Barbara O., Apartado 25510, Mexico City 12, Mexico 1950
Wetherbee, David K[enneth], 11 Dallas St., Worcester, Massachusetts 1947
**Wetmore, Alexander, U. S. National Museum, Washington 25, D. C. 1903
Weydemeyer, Winton, Fortine, Montana 1930
Weyer, Albert E., Depto. Medico, Cia Bananera de Costa Rica, Golfito, Costa Rica 1949
Weyl, Edward Stern, 3827 The Oak Road, Philadelphia 29, Pennsylvania 1927
Wheatland, Miss Sarah B[igelow], 85 Sachem St., New Haven, Connecticut 1942
Whelan, Miss Mary Elizabeth, 215 Catherine St., Muskegon, Michigan 1951
Whipple, Dr. V[ernon] L., 1606 Bruce St., St. Paul, Minnesota 1951
Whitaker, Mrs. Lovie M., c/o Dr. John R. Whitaker, School of Journalism, University of Oklahoma, Norman, Oklahoma 1947
Whitcomb, Pemberton, 130 Cedar St., New York 6, New York 1949
Whiting, Robert A[rchie], 2521 Cobb Road, Jackson, Michigan 1947
Whitney, 1st Lt. Nathaniel R[uggles], Jr., M.D., AO2239356, Quarters 1505, Apt. A, Robins Air Force Base, Georgia 1942
Wickstrom, George M[artin], 2293 Harding Ave., Muskegon, Michigan 1951
Wiggin, Henry T[aylor], 151 Tappan St., Brookline 46, Massachusetts 1941

Wilcox, Harry Hammond, Department of Anatomy, Medical School, Univ. of Pennsylvania, Philadelphia 4, Pennsylvania 1938
Wilcox, LeRoy, Speonk, Long Island, New York 1944
*Wilder, Theodore G[arfield], 125 Oxford Road, Waukesha, Wisconsin 1948
Wiles, Harold O[liver], 537 Campbell Ave., Kalamazoo, Michigan 1936
Wilkowski, William [Walter], 119 Bronson Ct., Kalamazoo, Michigan 1943
*Williams, George G., The Rice Institute, Houston, Texas 1945
Williams, Laidlaw O[nderdonk], Rural Route 1, Box 152, Carmel, California 1930
Williams, Raymond E., P. O. Box 193, Hawthorne, California 1950
Williamson, Mrs. John H., Cahaba Road, Rural Route 4, Box 900, Birmingham, Alabama 1952
Willis, Cornelius G[rinnell], 1 Carter Ave., Sierra Madre, California 1948
Willis, Miss Myra G., 1726 4th Ave., S.E., Apt. C, Cedar Rapids, Iowa 1944
Willms, A. George, Rural Route 2, Urbana, Illinois 1950
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Wilson, Mrs. Carl [Ruth], 11285 Lakepointe, Detroit 24, Michigan 1941
Wilson, Gordon, 1434 Chestnut St., Bowling Green, Kentucky 1920
Wilson, Harold Charles, Ephraim, Wisconsin 1938
Wilson, John Elder, 935 Academy St., Watertown, New York 1948
Wilson, Miss Rachel Esther, 621 First St., Huntington, West Virginia 1952
Wilson, Commander Rowland S[teele], Staff, Amphibious Group 3, FPO San Francisco, California 1941
*Wilson, Wynn Avis, 817 Greer St., Fort Worth 3, Texas 1950
**Wineman, Andrew, 150 Michigan Ave., Detroit, Michigan 1934
**Wing, Harold F[rancis], Rural Route 3, Jackson, Michigan 1941
Wing, Leonard [William], Department of Wildlife Management, Texas A. & M. College, College Station, Texas 1924
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Wolfarth, Floyd Parker, 133 High St., Nutley, New Jersey 1950
Wolfe, Col. L[loyd] R[aymond], Rural Route 1, Kerrville, Texas 1951
Wolfson, Albert, Department of Zoology, Northwestern University, Evanston, Illinois 1944
Wolk, Robert G[eorge], Lab. of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1952
Wolters, H. E., 28, Nikolaus-Becker-Strasse, (22c) Geilenkirchen bei Aachen, Nordrhein-Westfalen, Germany (British Zone) 1952
Wonsild, Hans Christian, Helleruplunds Alle 8, Hellerup, Denmark 1951
Wood, Dr. Harold B[acon], 3016 No. Second St., Harrisburg, Pennsylvania 1932
Wood, Merrill, 811 N. Allen St., State College, Pennsylvania 1945
Woolfenden, Mrs. Harriet Bergtold, 4600 Firestone Ave., Terrace 6, Dearborn 2, Michigan 1951
*Worley, John G[raves], 237 Charleston St., Cadiz, Ohio 1936
Wright, A[lbert] J[ay], c/o Bache & Company, Ellicott Square, Buffalo 3, New York 1952
Wright, Audrey Adele, 1312 Hepburn Ave., Louisville 4, Kentucky 1941
Wright, Bruce S[tanley], Northeastern Wildlife Station, University of New Brunswick, Fredericton, New Brunswick, Canada 1948
Wright, Lt. Col. Dana [Monroe], Box 36, St. John, North Dakota 1943
Wright, Howard F[ord], 3604 N. Temple Ave., Indianapolis 18, Indiana 1948
Wright, Philip L[incoln], Montana State University, Missoula, Montana 1940
Wyatt, Miss Grace, College Station, Murray, Kentucky 1946
*Wyeth, William M[axwell], III, Wyeth Co., St. Joseph, Missouri 1951
Wylie, William L[ewis], 1310 National Road, Wheeling, West Virginia 1947
Yeager, Lee E[mmett], Colorado Wildlife Research Unit, Colorado A. & M. College, Fort Collins, Colorado 1939
*Yeaton, H[arold] B[allard], 12908 Riverside, Van Nuys, California 1951

*Yeatter, R[alph] E[merson], Illinois Natural History Survey Division, Urbana, Illinois 1932
Yolton, William Phillip, Paul Smiths College, Paul Smiths, New York 1952
Young, Howard [Frederick], Department of Zoology, University of Arkansas, Fayetteville, Arkansas 1947
Young, J. Addison, II, 60 Argyle Ave., New Rochelle, New York 1942
*Young, James B[oswell], 514 Dover Road, Louisville 6, Kentucky 1937
*Youse, James Richard, Box 751, Carlsbad, New Mexico 1949
Yurick, Harry, 948 W. 4th St., Hazleton, Pennsylvania 1952
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Zimmerman, James H[all], 2114 Van Hise Ave., Madison 5, Wisconsin 1947
Zimmerman, John L[ester], 1515 Franklin St., Cincinnati 37, Ohio 1951
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LETTER TO THE EDITOR

In 1938 I accepted the Chairmanship of an informal committee which volunteered to gather facts about pronounced flights of Snowy Owls in North America. The purpose of the work was to provide an index to events in the Arctic rather than to contribute to an understanding of causes which is essentially an Arctic problem. It seemed feasible to gather data from over the whole of settled portions of the continent where Snowy Owls appeared on their regular flights. Three brief reports materialized and these were published in *The Wilson Bulletin* (55:8–10, 59:74–78 and 61:99–102).

In working as a volunteer committee, with round-robin procedure on a continental basis, delays are inevitable. Loss of data en route is also possible. Material on the flight in 1949-50 vanished completely and could not be traced. Since the Snowy Owl cycle is short and since we have found that major flights in the east and west do not necessarily synchronize, a transcontinental, volunteer committee has not been able to keep up with the owls.

The purpose of this communication is to allay any impressions readers of the *Bulletin* might have that Snowy Owls are permanently grounded. It also affords me opportunity to thank all the busy men who served on the now defunct committee, and to assure them that if the committee's difficulties are not attributable to its Chairman, then perhaps the undertaking was, simply, not feasible.

L. L. Snyder

Royal Ontario Museum of Zoology and Palaeontology, Toronto, August 25, 1952.

The *Proceedings of the Xth International Ornithological Congress*, held in Uppsala in June 1950, is now available for purchase from Professor Sven Hörstadius, Zoologiska Institutionen, Uppsala, Sweden. Book dealers may order it from Almqoist and Wiksell, Uppsala, Sweden. The price is 35 Swedish crowns ($6.75 U.S.).

The volume covers the proceedings of the Congress, and some 83 papers presented before the meetings under four main headings, viz., Evolution and Systematics, Migration and Orientation, Behavior, and Regional Faunas. The book is paper bound, in attractive form, with 622 pages (531 in English, 28 in French, 93 in German), 1 color plate, 30 photographs, 125 maps and diagrams, and 46 tables. The edition includes only copies for the members of the Congress and a small number in addition for sale. Those interested in purchasing should order without delay as the number available is limited.

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BY JEAN AND RICHARD GRABER

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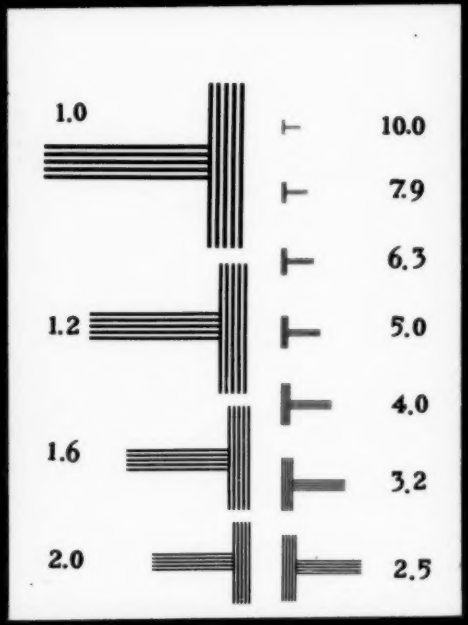

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In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and $100/20 = 5$.

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